

Technical and Bibliographic Notes/Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- | | |
|--|--|
| <input type="checkbox"/> Coloured covers/
Couverture de couleur | <input type="checkbox"/> Coloured pages/
Pages de couleur |
| <input type="checkbox"/> Covers damaged/
Couverture endommagée | <input type="checkbox"/> Pages damaged/
Pages endommagées |
| <input type="checkbox"/> Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée | <input type="checkbox"/> Pages restored and/or laminated/
Pages restaurées et/ou pelliculées |
| <input type="checkbox"/> Cover title missing/
Le titre de couverture manque | <input checked="" type="checkbox"/> Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées |
| <input type="checkbox"/> Coloured maps/
Cartes géographiques en couleur | <input type="checkbox"/> Pages detached/
Pages détachées |
| <input type="checkbox"/> Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire) | <input checked="" type="checkbox"/> Showthrough/
Transparence |
| <input type="checkbox"/> Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur | <input checked="" type="checkbox"/> Quality of print varies/
Qualité inégale de l'impression |
| <input checked="" type="checkbox"/> Bound with other material/
Relié avec d'autres documents | <input type="checkbox"/> Includes supplementary material/
Comprend du matériel supplémentaire |
| <input checked="" type="checkbox"/> Tight binding may cause shadows or distortion
along interior margin/
La reliure serrée peut causer de l'ombre ou de la
distorsion le long de la marge intérieure | <input type="checkbox"/> Only edition available/
Seule édition disponible |
| <input type="checkbox"/> Blank leaves added during restoration may
appear within the text. Whenever possible, these
have been omitted from filming/
Il se peut que certaines pages blanches ajoutées
lors d'une restauration apparaissent dans le texte,
mais, lorsque cela était possible, ces pages n'ont
pas été filmées. | <input type="checkbox"/> Pages wholly or partially obscured by errata
slips, tissues, etc., have been refilmed to
ensure the best possible image/
Les pages totalement ou partiellement
obscurcies par un feuillet d'errata, une pelure,
etc., ont été filmées à nouveau de façon à
obtenir la meilleure image possible. |
| <input checked="" type="checkbox"/> Additional comments:/
Commentaires supplémentaires: | Continuous pagination. |

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	14X	18X	22X	26X	30X
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12X	16X	20X	24X	28X	32X

THE

Canadian Agriculturist,

OR

JOURNAL AND TRANSACTIONS OF THE BOARD OF AGRICULTURE
OF UPPER CANADA.

OL. XIII.

TORONTO, JANUARY 16, 1861.

No. 2.

Feeding of Stock as a branch of Farm Management.

There is no department of the economy of the farm more important than that which relates to the feeding and management of the domesticated animals, and there is none, perhaps, in this country, so little understood, or practically regarded. In late years, since the introduction of pure and pensive breeds, more attention has been paid to this subject, and here and there may be found some buildings in connection with a system of management adapted to the requirements of the present advanced state of knowledge, and recent improvements in these matters.

An able paper on this subject appeared about a year since in the *Highland Society's Journal*, by Professor Anderson, from which we make the following abridged divisions:—

Properties of Food.—Practically, the problem which the feeder has to solve is, how to supply his cattle with such food, and in such quantities as to insure the largest amount of increase with the smallest possible loss. And for this purpose it is necessary, not merely to select the largest quantity of nutritive matters, but to attend to the proportions in which they are fed, and to restrain as far as possible all those actions which are productive of waste.

All the different kinds of food consumed by ruminant animals are found to present a general similarity in composition. They are composed of a nutritive and an indigestible part; the

latter consisting generally of woody fibre, which appears to be quite incapable of assimilation. It is most abundant in the herbaceous parts of plants, as in the straw of the cereals and the stems of the grasses, and is almost entirely absent in the grains when deprived of their outer husks, as, for instance, in wheat flour. The nutritive part always consists of a mixture, in very variable proportions, of several substances, which may be separated by different chemical processes. However much the relative quantities may vary, every food is found to contain at least three different substances, which are members of the three great classes into which the nutritive constituents of food may be divided, and which have received the names of the nitrogenous or albuminous, the saccharine or starchy, and the oily substances.

These classes of food constituents perform two different functions. The nitrogenous matters are employed to counter-balance the waste of the tissues, and to increase the quantities of lean flesh or muscle; and hence have been called the flesh-forming substances. The fatty and saccharine compounds, on the other hand, serve to maintain the process of respiration, and the animal heat, and for this reason have received the name of the respiratory or heat-producing elements. They supply also the fatty matters stored up in the body, which form a very large proportion of the weight of the animal.

It is sufficiently obvious that, as the two great functions of nutrition and respiration must pro-

ceed simultaneously, the best and most economical food will be, first, that which contains its constituents in the most readily assimilable form; and, secondly, that which contains them mixed together in the most suitable proportions.

The importance of a proper balance between the relative quantities of the two great classes of nutritive constituents must also be sufficiently obvious. If, for instance, an animal be supplied with food containing a large quantity of nitrogenous and a deficiency of heat-producing compounds, the result must be, either that it languishes for want of the latter, or it is forced to supply the defect by the increased consumption of food; in doing which it must take into its system a much larger amount of nitrogenous matters than are requisite for supplying the waste of the tissues; and thus there is an unnecessary and wasteful expenditure of these substances.

The proper adjustment of the relative proportions of nitrogenous and non-nitrogenous food is the foundation of successful feeding, and its importance has of late years been fully recognised by chemists.

Importance of Warmth, Cleanliness, and Ventilation.—The other great source of loss of food is the maintenance of the animal heat, which is a matter in this extreme climate of the highest consideration. It has been well observed that an animal may, in certain respects, be compared to a furnace, in which a quantity of fuel is burned to produce the animal heat. It may, in fact, be stated as a general rule, that the warmer cattle can be kept the more rapidly will they fatten, all other circumstances being alike. The cleanliness and proper ventilation of the houses should be attended to, and the state of the dung observed, care being taken that the excretions are regular, and every tendency to scouring, or the reverse, immediately corrected.

Importance of Bulk in Food.—Although the presence of a sufficient quantity of nutritive matter in the food is naturally the most fundamental matter for consideration, its bulk is scarcely less important. The function of digestion requires that the food shall properly fill the stomach; and however large the supply of nutritive matters may be, their effect is imperfectly brought out if

the food be too small in bulk; and it actually becomes more valuable if diluted with woody fibre, or some other inert substance. On the other hand, if a food be too bulky, the sense of repletion causes the animal to cease eating long before it has obtained a sufficient supply of nutritive matter. It is most necessary, therefore, to study the bulk of the food, and to consider how to mix different substances in such a manner as to adjust the proportions of nutritive matter to their bulk.

Farm Crops; how best and most economically used as Food.—These crops are hay, straw, turnips, mangold, peas, potatoes, &c., and they include those most remarkable for their bulky nature; the turnip, for instance, containing less than 8 per cent. of nutritive matters. All of them are also remarkably deficient in fatty matters; the bean, which is much richer than any of the others, rarely containing so much as 5 per cent. The result of all feeding experiments leads to the conclusion, that animals cannot be brought to the highest degree of fatness upon turnips, or even on hay, alone.

A peculiarly interesting series of experiments by Wolff have shown that sheep, which, when fed on hay of average quality, attain a weight of about 90 lb., will gain an additional 10 lb., if rape cake, or some other food containing a large quantity of nutriment, be given them. As a general rule, such substances as oil-cake, rape-cake, corn meal, &c., greatly promote the fattening process, and they operate partly by supplying a larger quantity of nutritive matters within the bulk which the stomach requires, and partly by increasing the supply of nitrogenous matters, in which they are particularly rich.

Proportions of Flesh and Heat-producing Elements in Food.—All, however, depends upon the ratio of flesh and heat-producing elements being the right one; and it would appear that this proportion differs according to the object of the feeding. Wolff, who has directed much attention to this subject, states, as the result of his experiments, that for maintaining animals at a moderate weight they should be as 1 to 8, for young cattle as 1 to 7, and for fattening as 1 to 5 or 6. He found by actual experiment that the production of milk was largest when the

two classes were in the ratio of 1 to 7; but his conclusions with regard to fat cattle must be taken with some reservation. The most important point which he has brought out, is the very high value of *Rape-cake*; and it is interesting to know that in this respect his results bear out the repeated recommendations which chemists have given of that substance. He has shown that 1 lb. of rape-cake will produce 1 lb. of milk, and, under favorable circumstances, still more; and its effect was better than that of an equal weight of grain. It appears, also, that in feeding it is equivalent to more than twice its own weight of hay. The great difficulty which is encountered in the use of rape-cake is that cattle dislike its taste; and if they are supplied with a full quantity of turnips or straw, they will consume just a sufficient quantity of these foods to maintain an average weight, and reject the rape-cake offered them. The way in which this is to be obviated is said to be quite simple. Of course it will not do to diminish the quantity of other nutriment given to the cattle, for that would defeat the objects of the feeder. But a part of the more bulky food, such as turnips, must be replaced by some substance, such as grain, containing the same amount of nutriment in a smaller bulk; and then the craving for a sufficient quantity to fill the stomach will induce the animals to consume the rape, and after a few days they will become accustomed to the taste. Both rape and flax are readily grown in Canada, and our farmers would do well to avail themselves more largely of these valuable substances for feeding purposes.

The Profit of Feeding.

For the Agriculturist.

It is evident that this consists in a valuable return from the animal of the food consumed. In the horse, this can only be received in labor or breeding; in the ox, from labor and flesh; in the cow, from the milk, the flesh, and her young; in the sheep, it may be returned in its fleece, its carcass, or its progeny, and the swine only by its progeny and flesh. The manure we expect from all, and if this be not secured and judiciously used, few animals about the farm will be found to yield a satisfactory profit for their food and attention, though it is evident it should form but a small part of the return looked for.

Animals are only profitable to the farmer, when they yield a daily income, as in their milk or labor, or annually, by their young or fleeces, unless it be in a course of regular improvement, either in their ordinary growth, or preparation for the butcher. The animal must consume a certain amount of food merely to keep up its stationary condition, and to supply the materials for waste, respiration, perspiration, and the evacuations. These must be provided for in all cases, before the farmer can expect anything for the food.

Frequent observations have shown that an ox will consume about two per cent. of his weight of hay per day to maintain his condition. If put to moderate labor, an increase of this quantity to three per cent. will enable him to perform his work, and still maintain his flesh. If to be fattened, he requires about four and a half per cent. of his weight, daily, in nutritious food. A cow to remain stationary, and give no milk, eats two per cent. of her weight daily; and, if in milk, she will consume three per cent. If these statements are correct, which it is certain they are in principle, though they may not be entirely in degree, it will require the same food to keep three yoke of cattle in idleness, as two at work; and the food of every two that are idle, will nearly support one under the most rapid condition of fattening. Two cows may be kept in milk with the same feed that will keep three without.

No practice is more impolitic, than barely to sustain the stock through the winter, or a part of the year, as is the case in too many instances, and allow them to improve only when turned on grass in summer. Besides subjecting them to the risk of disease, consequent upon this privation of food, nearly half the year is lost in their use, or in maturing them for profitable disposal; when, if one-third of the stock had been sold, the remainder would have been kept in a rapidly improving condition, and at three years of age they would probably be of equal value, as otherwise at five or six. It is true that breed has much to do with this rapid improvement, but breed is useless without food to develop and mature it.

Ancaster, January, 1861.

W. A. C.

An American Farmer's Visit to Canada.

[We copy from the *Rural New Yorker* the following letter from Mr. John Johnston, an extensive farmer near Geneva, who has particularly distinguished himself, by a thorough and efficient system of draining his land, and other agricultural improvements. Such a man's candid opinion of our agricultural doings in Canada is worth a permanent record in our columns, and deserves the best attention of our people. We

are not surprised that Mr. Johnston should have so highly admired the splendid long wool sheep from the flocks of Messrs. Guy & Jeffrey.—[Evs.]

Mr. Moore:—I have recently been in Canada in the towns of Whitby, Pickering, and Darlington, and I think these towns the garden of the portion of Canada I have visited. The land is excellent and highly cultivated; buildings good, equal to any farming district I have ever passed through, with the exception of those near large cities, and their highways are as good as any I ever travelled. I was quite surprised to see such roads and buildings, especially when I know that thirty years ago, and perhaps less, that whole district was a wilderness. The timber was principally beech and maple, yet the stumps are all gone, and the country looks as old as around Geneva.

I attended the Agricultural Show at Whitby the first day, when the grain, roots, implements, and ladies' work were exhibited. The roots were the best I have seen; the carrots and turnips very large. The grain was also very fine. The white wheat (Soule's) I think could not be excelled in any country. The spring wheat shown was good, but I saw better spring wheat in Canada last year. The peas and oats were very good. I am sorry that we cannot raise peas like the Canadians. I think our oats a good.

The Ladies' work was beautiful, but I am no judge of such articles. There were some fine portraits and other paintings exhibited in the same hall, and what I thought a fine toned piano was kept in use all the time I was there.

The Mechanical productions (farm implements, &c.,) were also exhibited the first day. Some of those long 250 lb. ploughs were there, but the farmers are beginning to find out that what they call Yankee ploughs are better than the long, heavy ones which they have held on to so long, without ever reasoning on the subject. Many are now throwing them aside, and using the Yankee plough they so long held in derision, or at least imitation Yankee ploughs manufactured at Oshawa. There were two kinds shown: some with cast-iron beams, similar to ours; then there were steel ploughs with wooden beams, similar to those made by Messrs. REMINGTONS, MARKHAM & Co., of this State, but not near so good a plough, in my opinion, and I believe the latter would sell better if introduced there than those made in Oshawa. The manufacturers at Oshawa might do well to have a plough from Ilion as a pattern. Although there is \$3 duty on each plough, I have no doubt Messrs. R., M. & Co., could under-sell the Oshawa manufacturers, or at least they could sell a better article at the same price. Their cast-iron beam ploughs appeared to me to be equal to any of ours, and for some purposes better. I thought well of the cultivators shown. The iron ones were new to me, and I do think must answer

the purpose they are made for, better than any I ever saw. There were two kinds of harrows shown; one a rotating, on a new principle; the other was an improvement on the common double harrow, which I think good. There were different kinds of cutting boxes; those I never pay much attention to. I don't see what use cattle have for teeth if their fodder has to be cut for them.

The second day the stock were shown. The Horses, or at least part of them, were of immense size—I thought altogether too heavy for farm work—but they were noble looking animals. One black and a gray were beautiful animals of their kind, but I thought them too large. There was also a very good show of Durham Cattle. A Mr. THOMPSON showed some very good, and a large number. There were others that showed very good Durhams. There were also some very good fat cattle shown. A five year old Devon heifer (imported,) was very fine and very fat, although I believe she only got the second premium, a Durham heifer of same age being fatter on the rib. They were both superior.

But the sheep excelled all. They were in great numbers, and for fat and size I question if they could be surpassed anywhere. Mr. WM. JEFFREY had some very fine. A Mr. GUY had also some that were very good. But they were all good—not a bad lot among them. I examined Mr. JEFFREY's and Mr. GUY's on their farms, and really I think there can be no further improvement made on them. Mr. JEFFREY's are pure Leicester,—Mr. GUY's have some cross of the Cotswold, at least a portion of them. Mr. GUY has also some pure Cheviots. It was forty years since I had seen any of them. They were fat and fine, and I think pure bred; but the Leicesters and Cotswolds are so much larger, they will always be the best favourites in Canada, although I think a cross with the Cheviot might give them more hardiness and also improve the mutton. At Mr. GUY's I saw his buck that took the first premium at Kingston, for three year olds, last year. He then weighed 352 lbs. He is now so enormously fat that it is with great difficulty he can rise. I never saw his equal. It is worth a journey to Canada to see him.

I was delighted with the sheep I saw at the show and on Mr. JEFFREY's and Mr. GUY's farms. There was a pair of fat ewes shown that took the first premium; said to weigh, together, 480 lbs. There were as broad in the back as a good Durham cow. The Canadian farmers can make wonderful sheep. Mr. JEFFREY had photographs taken of some of his bucks, but they were not so good as the originals.

The wheat crop in that section has been excellent this season. Their spring wheat was a very large crop, but I did not think the quality very good. They can raise but little winter

wheat near the lake (Ontario.) The midge ruins it there, but from twenty to forty miles back, they raise excellent white wheat. I heard of one fine field of five acres in the township of Scott, that gave 52 10-60 bushels per acre. The field was summer fallowed, and the neighbours said the owner kept ploughing it from spring until seeding time, manured it, and put a large quantity of ashes on it; but they acknowledged it paid him after all. That was a larger crop than I ever saw. I brought samples of the best white winter wheat found, but it is no better than some here, although it was said to produce more to the acre. I think if they would sow from 200 to 300 lbs. of salt to the acre on their spring wheat, it would improve the quality very much. The straw, although not rusted, is of a dull dark color; and when such is the case, the quality of the wheat is never first-rate. I advised a gentleman last year, who lives north of Rice Lake, to try salt. I saw his foreman this year; he told me they salted part of their spring wheat, and it was better by far than that not salted.

Yours, &c., JOHN JOHNSTON.

Near Geneva, N. Y., 1860.

Sheep in Connection with Wheat Growing.

In a recent number of the *Journal of the New York Agricultural Society*, Gen. Rawson Harmon, of Wheatland, N. Y., gives the following account of his practice with sheep in connection with clover and wheat growing, so as to keep up the fertility of the soil. Much of the land in Canada, as well as in the States, has been deteriorated by too frequent cropping with wheat, and both time and experience will be required to restore it to its former state of fertility. Wheat, clover, and sheep are admirably adapted to go together, and sustain the productiveness of the soil. On light lands, suitable for wheat, such as the oak plains, in the County of Brant, sheep are found to be a necessary adjunct in arable culture, as the practice of Hon. David Christie, Mr. Moyle, and others, clearly shows.

The following practical remarks we commend to the attention of our wheat growing farmers, who have a soil and situation adapted to clover and sheep:—

“For many years we have kept two sheep to the acre of wheat land; say for one hundred and fifty acres, three hundred sheep may be kept, and the regular rotation of the wheat and clover kept up on the one hundred and fifty acres, forty of which should be in wheat each year, and ten

in corn and roots. Clover seed should be sown in March or April, six quarts to the acre, and as soon as the ground is dry in the spring, one bushel of plaster should be sown to the acre.—Barley or oats should follow corn and roots, and seeded as above; so we have fifty acres seeded with clover each year, ten acres in corn and roots, leaving ninety acres for pasturing and mowing. A team is to be kept for the work on the farm, and three or four cows, for the use of the family; and no other stock should be kept, except hogs, for the family use, and they should be limited, for mutton is cheaper and more wholesome meat than pork. The above, for the use of the family, is all the stock that should be kept on a wheat growing farm, except sheep; and with the above amount of land, three hundred sheep may be kept, and well cared for.—They should be kept at the barn till the first of May, when they should be turned out to the fields which the corn and root crops are to occupy, and where the wheat is to be sown, remaining till the clover in the pastures is half grown; then give the sheep a chance at that, which will keep them till the clover commences heading out where the wheat and barley has been harvested. One great cause of failure in sheep husbandry is in letting the sheep run on the pastures long after clover has done growing, and in the spring before it commences growing, when there is no tallow in the clover, and it is gnawed into the ground, and much of it destroyed.

For winter management most farmers fail, in giving the sheep too much run. Where they are stabled, or kept in close sheds and not suffered to run at large, from November till May, one-fourth of the food can be saved, the flock kept in better condition, giving one-fourth more wool, and making twice the amount of the most valuable manure made on the farm. From fifty to one hundred are to be kept in a flock. Sheep of about the same weight should be kept together; where lambs or yearlings are suffered to run with full grown sheep they will not do as well. Lambs should be taken from the ewes about the 20th of August, if dropped in the month of May, and a few yearlings put with them, and they will be more easily controlled, and by the 20th of September they should be fed moderately with oats or bran and a little salt every day, so that by the time they come to the barn they are tame and in good condition for wintering. The first clover in the barley field would be a favourable field for lambs. The corn, roots, and barley, should be wholly fed out on the farm; and, with the straw, cornstalks, and hay, all may be well supplied from November till May, except the team, which it may be well to keep in the stable when not at work. All the manure made each year should be applied to the corn and root field. Wethers, three post, and ewes that begin to lose their teeth, should be put in one yard, and grained through the

winter, and then they will be fit for the butcher, and will pay for the food they have consumed; and they must be disposed of, so as to give place for the increase. No sheep should be sold from the farm till they have come to full maturity.—The selling of lambs to the butchers, is ruinous to a flock—or letting butchers go in and take the best of the flock. Old sheep, as well as lambs, should have some grain or roots every day while at the barn. Sheep will pay much better for the grain they eat than the man you sell to will.—No animal kept on the farm pays better than the sheep—for their rapid increase, with their fleece and meat, give a better return for what they consume than any stock kept on a grain farm.

Land Drainage.

At the recent annual meeting of the East Zorra Agricultural Society, John Dunlop, Esq., of Woodstock, read a useful and practical Essay on Drainage, which we insert, slightly abridged, as follows:

In twenty years practical experience of agriculture and drainage operations, I am convinced that all the low, damp land of this township, at present growing aquatic or other plants utterly worthless to the husbandman, and considered by many, as not worth cultivating, will after undergoing the operation of under-drainage, deep ploughing, and good cultivation, prove to be the most valuable lands in the township, as they at present contain an immense amount of vegetable matter that only waits to be assimilated into the bulk of cereal and root crops by draining the soil thoroughly.

Before under-draining came into operation, the most primitive mode, I believe, was to form the land into ridges and furrows, the width of these varying from 10 to 30 feet, but the general average being about 16 feet; these ridges being well raised up in the centre, thus forming a deep track on each side to carry off the surface water. When the land was in crop, the yield at the furrows was very small, owing to the dampness of the soil at that spot; under-draining was then tried as an experiment, and found to succeed admirably.

Before the introduction of tiles, I used to a considerable extent broken stones for draining—the main or receiving drains having a hand-built conductor formed of the dry material, with the addition of a few inches of small stones placed above the conductor. The lateral drains were filled to the height of about twelve inches, with stones (broken small), a little straw, or perhaps the sod, was placed above to prevent the fine soil from getting among the stones, preparatory to filling up the drain. These drains were generally cut to the depth of 20 to 24 inches,

and the distance between each drain varied from 16 to 24 feet, according to circumstances.

These drains acted very well for several years; but in many cases the fine soil got down among the stones, and filled up the drain, especially in fine light soil.

I have also tried to drain with the small branches of trees, cut into lengths of about 12 inches, and made up into small bundles, tied together with tared twine. These faggots were placed in the drain in a sloping direction, pressed well together, and covered over with the sod before filling in the earth. These faggots, if made of durable wood, will last several years, and are very cheaply manufactured. I saw one of these drains opened after having kept clear for 12 years, it was quite good, but too shallow. The material used for faggots was the white hawthorn.

About 15 years ago I tried lumber boards nailed together, so as to form a conductor for the water. This was on a small enclosure of about five acres, the soil a black loam and very wet. The drains acted well and are still in good working order, but the high price of lumber in Scotland made this sort of draining too expensive.

On strong clay and pre ty free from stones, I have drained a good deal; and used the sod or turf, got from the upper surface of the drain track. These drains were opened to the depth of 3 feet and cut in the form of a wedge. The sod was cut by a tool made for the purpose, and was rammed down quite firm, before being covered up. This is a very cheap mode of draining, when the soil is suitable, as they will work well for ten or twelve years if properly built. I used to pay for such drains about 7 to 9 cents per rod. Where neither stones or tiles are to be had, I would recommend a trial being made of the faggot or turf wedge drain.

The tile manufactured of burnt clay, commonly called "the Horse shoe tile," has latterly been adopted in Britain to a great extent. The expense of carriage is moderate, and they form a durable material that will last for many years. Soles or flats of the same material, are used, on which to place the tile on the bottom of the drain. Some use wood or slate instead, and many put in the tiles without soles of any sort; but this altogether depends on the nature of the soil. If wet or soft, soles are absolutely necessary; but if a hard or gravelly bottom, the soles may be dispensed with. I have tried both ways, but the soles make the best drain.

Within the last few years the Horse-shoe tile has been in a great measure superseded by the pipe tile. These are made of various patterns, the oval and circular ones being the favourite—the oval shape similar to an egg placed on end, is considered by many the most preferable, the run of the water being so concentrated that it acts as a scour to the sediment in the pipe, and

so carries it off. These pipes are generally of a square shape on the outside, and are very easily laid on the bottom of the drain. I decidedly prefer a pipe tile of any description to a horse-shoe tile sole, as I have seen many of the latter nearly silted up, a pipe tile I never saw so.

The size of the horse-shoe tile for lateral drains is generally 12 or 13 inches long, 2½ inches wide, and 3 inches high; and the prices were \$4 per 1000. The soles half-price.

The size of the pipe tile generally used for lateral drains is from 12 to 14 inches long, and 2 inches of a bore. Some use a bore of one and a half inch, and even a bore as small as one inch; but these are not so common as the two inch bores. The price for the two inch pipe was \$4 50 per 1000. The pipes necessary for the receiving drains are of a larger bore and corresponding price. I have tried a 4 inch bore to carry off the whole drainage water of 10 acres of land with perfect success.

Twenty-five years ago, drainage of land in the West of Scotland was as much in its infancy as it is at the present day in Canada. Tile manufactures were few and far between, the prejudice against draining was strong, the enlightened agriculturists persevered, and were backed up by one of the most extensive proprietors in Ayrshire, the late Duke of Portland who tile-drained the whole of his estates on the then most approved method. The result was that crops were nearly doubled, and the rent-roll greatly increased. There were many drawbacks to retard this improvement. The greatest, I believe, were prejudice and inexperience, but as the work progressed much useful information was gained and improvements made on the common method; many of the original drains were condemned, and a more perfect system followed out. I myself have seen the tenant drain his farm twice over, and in some cases I have seen the same piece of land drained three distinct times. No such thing is now thought of in Ayrshire as draining with faggot or turf, and very seldom even with stones.

When the horse shoe tile was first used, and for many years after its introduction, the common depth to cut the drains was generally about 20 inches, and on a stiff retentive clay soil the drain tracks were generally from 16 to 20 feet apart, regularly over the field. The result at the depth and width was profitable, as green crops could be grown on such land after drainage that would never have been thought of without.—The cereal and grass crops were much improved likewise.

Some persons more enlightened than others suggested that deeper drains should be tried and proposed 2½ and 3 feet ones. They were thought too speculative or too plenty of money, and few would hearken to their propositions. One or two, however, did try the experiment, and found it to answer better than the shallow drains.

More followed in the wake, and latterly deeper were the trials, till now the best depths are considered to be from 42 to 56 inches, according to the nature of the sub soil.

For a regular system of drainage, it is necessary to ascertain the nature of the sub soil, to know to what depth, and at what distance apart, the drains should be cut. A practical hand is the best to know this, as also to lay off receiving and lateral drains. The receiving drains ought to be concentrated as much as possible to one point, in order that the whole drainage water may keep up a clean scour of the pipes, and no silt be allowed to obstruct the passage. I need scarcely remind you that all outlets from the receiving drains ought to be kept thoroughly clear, else the drains have a poor chance of succeeding.

Some advocate cutting the drain tracks across, or on the angle of a piece of steep land, so that they may catch all the water that runs down the declivity. Others again, prefer cutting the drain tracks right up the face of the declivity, so that the drains may tap all the different strata, as they overlay each other and crop out of the hill side, I have tried both plans; the latter I decidedly prefer, as you gain your object most effectually.

On the stiff clay soil of the West of Scotland, our 3½ and 4 feet drains were generally placed from 16 to 21 feet apart regularly over the field. They cost from 15 to 20 cents a rod for opening the track, laying in the pipe, and re-filling the soil. I am of opinion that the open sub-soil in this district is much easier wrought than what I was accustomed to; and though labour be more expensive here, yet I think the drainage could be done for the same money. The tools for draining operations are not as yet introduced to this district; but I am informed they can be had in London, C. W.; and no man should attempt deep drainage with the common tools sold here, as the work is done with a great deal of extra and unnecessary labour.

At one time I used a drain-plough for assisting the workers in opening the drains; but I did not approve of it, as it made a rough and coarse job, and it was a cumbersome implement to work with and very sore on the men and horses. In making my contracts, I found the allowance calculated on for partially opening the tracks with the plough did not give remuneration for the teams; so that latterly I threw the plough aside as a worthless implement, and preferred to let the contracts without giving any assistance whatever.

From the great amount of money expended on drainage in Britain, I should think it is an ample guarantee that, if judiciously applied, drainage work will pay, aye, and does pay too; and if it pay in Britain why not in Canada. I have drained land in Ayrshire that was so marshy and wet that it produced nothing but the coarsest

grass, and in draining it we had to carry many of the pipes over the land by manual labour, as many parts of it would not carry a loaded cart. The tracks were 18 feet apart, 4 feet, and in some parts 6 feet deep. The first crop after draining was turnip, and they were excellent; it was followed by a crop of oats, as heavy a crop as I ever saw growing; and ever since that field has produced most luxuriant crops. When I look at the low marshy land of this Township, it always brings that field to my recollection; and I am decidedly of opinion that such land will as well repay for such improvement as the field I allude to.

There are several items absolutely necessary to be strictly adhered to in drainage operations, such as forming a uniform sloped bottom, on which to lay the pipes; the joining the pipes to each other, and connecting the lateral to the receiving drains: and fixing the pipes in a firm bed, preparatory to filling in the soil. The efficiency of the drain in a great measure depends on having these matters thoroughly done, and therefore great attention should be placed on seeing these properly executed.

When the land appears to be nearly level, great care should be taken that the drains be cut with such a declivity as will insure a free run for the water; and if any doubt exist as to the declivity, a levelling instrument should be used.

I am thoroughly convinced that draining with pipes, though the most expensive at the first, will in the long run be the cheapest; and any one proposing to drain their land will find their aim better accomplished by doing it substantially at first, although they should do a less extent of land than by going over a greater extent of surface with superficial drainage.

Should any doubt exist as to the porousness of the soil, and its capability for drawing off the water by under drainage, I would advise experiments to be made, and would put in drains 4 feet deep and as wide apart as 40 or 50 feet. Should that distance be found too wide apart for the properly drawing off the water, it is easy to put in another drain between. Practical experience will soon teach you the proper width drains should be apart.

The majority of the land-owners of this Upper Province labor under many disadvantages; their capital is limited, their farms are in many instances but recently reclaimed from the forest, and there are so many improvements to be made, absolutely necessary to the cultivation of the land and wants of the stock, that till once all these are done, but little drainage operations can be gone into; but once thoroughly set agoing, I hope to see the day, when our low swampy land, at present worthless for cultivation, and a generator of malaria, will be converted by drainage operations and proper cultivation into the finest alluvial soil, capable of bearing the most luxuriant crops of every description.

From the scarcity of money for expending on permanent improvements, such as draining, I am strongly inclined to advocate that the Provincial Government should encourage such improvements, and follow a plan similar to that adopted by the Government of Great Britain; by giving a Lands Improvement Act,—which has been the means of imparting a vast impetus to the improvement of Agriculture, increasing the produce of the soil to such an extent as gave increased rents of from 30 to 60 per cent on many farms that came under my own observation. The working of such an Act is quite simple and not very expensive. The cost to my late constituents in Ayershire, who expended upwards of £10,000 on drainage under this Act, did not cost them 2 per cent, for all the legal charges, and Surveyor's fee; but I dare say the charges in this Province would be higher, as the smaller the sum expended, the costs are proportionably increased, the trouble being nearly the same for a large sum as for a small one. The imperial Government loaned out money under this Act, payable by annual instalments in 22 years at the rate of 6 per cent on the borrowed money.

I beg to inform you that all may now have an opportunity of testing the benefit of draining in this district, as Mr. Close, of Woodstock, has now in operation an imported machine for making tiles and pipe tiles of various sizes. Those I have purchased of his last manufacture are of such a quality as I feel confident cannot be surpassed in the Province. He is now making such preparations as will enable him by spring to supply a large demand. I believe his prices next season for the pipe tile of 2 inch bore will be about \$6 per 1000. I would recommend you to make an experiment on draining, though it should be to a small extent.

Canadian Flax.

[From the Belfast Northern Whig.]

The soil of America has long been celebrated for the growth of flax. Thousands of acres of the United States are annually set apart for that purpose, but the farmers rarely think of using the straw. The great object is to take off the seed; as for the fibre, few of the growers take the least trouble so far as regards the textile material of the plant.

In Canada a considerable breadth of land is every season occupied by flax. The soil of this colony, as well as the temperature of the air, in many instances closely resemble those of the North of Ireland. A gentleman who resides within a few miles of Belfast, and who recently returned from a tour through the northern lands of Canada informs us that he passed several farmsteads, the appearance of which was very much like those in some parts of Down and Antrim. On enquiry, he found that the great proportion of the landowners were either direct Irish or the

descendants of Irish immigrants. Flax culture, as we have said, is carried on there by several of the farmers, but the deficiency of means to prepare the straw for market, and the still greater drawback arising from the want of local consumption, have hitherto kept the growth down to the mere requirements of the seed trade.

In yesterday's *Whig* we noticed the arrival in town of some specimens of Canadian grown flax, brought over by Mr. Blaikie. These samples were yesterday exhibited to several of our local merchants and spinners, and a favorable opinion has been pronounced on their quality. On making particular enquiry into the matter, we have learned that Messrs. Blaikie & Alexander, of Toronto, had grown this season about two hundred acres of flax, on a farm at Norval, about thirty miles from Toronto. In the same district, those gentlemen have erected a scutch mill, on the best principle, for the purpose of giving future growers all possible facilities as to the preparation of flax for market. The samples exhibited in Belfast yesterday, were thus prepared. Owing to the great drought by which the upper section of Western Canada was visited in the early part of the season, the fibre of the flax is shorter and less silky than it would have been under more favorable circumstances; but, on the whole, the samples shown have been valued at 8s. to 10s. the 14 lb. stone. The yield of the Canadian soil is fully equal to that of the average of the North of Ireland, some of the finer lands producing six cwt., or about forty-two stones to the statute acre.

Hitherto the chief object of the Canadian farmer has been the growth of wheat. To that species of production he clings with something like superstitious feeling, and the result is that, when a backward season comes on him, he seems prostrated, as was the Celt of former days when the potato crop proved defective. It has, therefore, been considered by thinking men that the introduction of flax culture on a scale in some degree equal to the resources of the colony would be most advantageous, and, while it would diversify the enterprise of the colonial farmer, it would add to the productive power of the Province.

The organization of the Indian Flax Society leads to the hope of vast good being accomplished for the linen trade. This, however, will chiefly arise from the increased supplies of coarse fibre, an article now so much required in the production of the heavier description of goods. Canadian lands differing materially from those of the Punjab, promise to do some thing towards meeting the deficiencies felt in supplies of medium and finer ranges of flax; and if forty or fifty thousand acres were annually raised in British North America, and the great proportion shipped to this country, it would supply a growing want, without in the slightest degree interfering with the Asiatic product.

The requirements of the linen trade are, in fact, at present so large, and the prospective wants seem so extended, that, to meet the demands of spindles and power-looms, twice the existing average would not be sufficient. There are now great facilities for the transport of farm produce from Canada to Liverpool. Flax, purchased at the markets of Toronto or Montreal, would be shipped and conveyed from the St. Lawrence to the Mersey in the space of twelve days.

As the matter stands it is one of mere individual enterprise. If the farmers of Canada prepare a portion of land for flax-growing, and be able to produce a good article of fibre, there will be no lack of customers for it. Continental spinners will now be competing with those of Leeds, Belfast, and Dundee, for the purchase of certain qualities of flax, and the more extended the growth of all varieties of raw material, the more successful will be the enterprise of manufacturers.

Farm Implements and Machinery.

We copy the following excellent advice on this subject from the *Country Gentleman*:—

During the more leisure season of winter, farmers will find it advantageous to examine, repair and improve all their implements and machines. It is in these that agricultural progress has been most strikingly marked within the past twenty years; and the cultivator who does not keep pace with the improvements made is wasting a valuable element of success. There is less danger of imposition in this direction than in some others, for a year's use will establish the character of any machine. A knowledge of the principles of mechanism, added to the experience which every observing farmer should possess, will enable him, in most cases, to judge with a good deal of certainty beforehand on the value of a new invention.

There are two points that should always be kept before the farmer's eye when making any provision of this kind. The first is, simplicity of structure. A simple machine is cheaply bought, easily managed, not easily deranged, and quickly restored to repair. Other things being nearly equal, always buy the simplest machine. The crowbar is a fine illustration—simple, efficient, used by every one, valuable for many purposes, and never out of joint. The great difficulty in replacing the plow with any other cultivating machine is its great simplicity. Complex husking machines have all given place to the old-fashioned appliance of thumb and finger, armed, sometimes, with husking thimble or peg, but oftener without.

The greatest advantage derived from machinery is where the powerful muscles of horses are made to accomplish what before was done

by the weaker force of man—as in the mowing or threshing machine; or where the slow manipulation of fingers, with no expenditure of strength, is changed to a greatly increased rapidity of the same work by mechanical combinations, instances of which occur in the garden drill and the sewing machine. Some complexity is here necessary, and is admissible when great speed is gained; but when a machine works but little faster than the unassisted hands, it may be discarded, as a universal rule, unless extremely simple.

The second point to observe in providing farm machinery is to select such as each farmer can work with his own unborrowed forces. A threshing machine, for example, that requires six or eight horses to drive, one-half of which must be hired or borrowed for the occasion—or six or eight hands to man it, one-half of whom must be collected through the neighborhood before a sheaf can be threshed—is an inconvenient machine—troublesome and not economical. If the farmer has but two horses and two hands, he should procure a thrasher which he can work. He has then complete command of his own operations, and can, on any occasion, for a day, half day, or less, set his machine to work when he wishes a supply of grain for seed or for bread, or straw for his cattle. Many spare or stormy days may be advantageously occupied where such a convenience as this is always at hand. The farmer's wife will not complain of being relieved of boarding a number of hands required to man a ponderous ten-horse thrasher, nor will he himself get the fidgets so often in seeing all his collection of men standing idle while a broken cog is undergoing repairs.

Drilling vs. Broadcast Sowing of Wheat.

There is, perhaps, no grain crop in the United States in which greater improvement has been made in its cultivation than in wheat, particularly in the great West—and the reason of this is obvious. Until within a few years our Western farmers were without the benefit of railroads and consequently without a market for their surplus wheat, hence there was no motive to increase the crop by extra cultivation beyond the wants of the family or neighborhood. But in more modern times since the opening of the markets of the world to western farmers, wheat has become one of the most profitable crops in a large section of country, and hence our progressive farmers have found it to their interest to prepare their lands better and to make such other improvements in wheat culture as might be brought with more and better implements for cultivation. Among these the plow, the roller, the harrow, and the drill, have been added or greatly improved, and yet we are far behind the best farmers of Western New York and those of

England in the perfection of wheat growing. Among the improved implements that have been introduced there are none more important than the wheat drill; a large portion of the wheat that is sown is made to follow immediately after corn where the drill cannot be used to advantage owing to the interference of the corn stubble and weeds that are left on the land after harvest. But where wheat is sown on fallow land or after clean crops, the benefits of the drill have been enumerated again and again by those who have used them, and we do not know an instance where the drill has been introduced that the farmer is willing to discontinue its use where the nature of the preceding crop will admit of its operation; and it is only necessary for the careful observer to witness the crops growing together at any stage of their growth that have been put in by the two methods, to be fully convinced of the advantages of the drill system.

A prolific writer, and constant contributor to one of our most popular agricultural periodicals, has labored through several columns in two consecutive numbers of the work, with the promise of "further consideration of the subject, when other facts and inferences will be adduced in illustration of the subject," to prove that drilling wheat has no advantage over the old method of scattering the seed promiscuously over the surface, to take its chance for being covered at sufficient depth to insure vegetation, or to remain on the surface liable to be devoured by the birds.

It is but a short time since the same writer labored ardently to prove that in transplanting trees from the nursery with their roots mutilated and half destroyed, as is too often the case in digging them, it was better to plant them with their entire tops than to cut them back in proportion to the loss which their roots had sustained; and in a later number of the same work, the writer labors with equal industry to prove mulching newly set trees is equally inadmissible. Now, all experience, common observation, and the least knowledge of vegetable physiology, as well as common sense go to prove the absolute necessity of the one and the importance and advantage of the other of these processes; but the writer seems to have a mania for taking the opposite sides of all popular questions of the day that have a bearing upon improvements in agriculture. With all intelligent readers his teachings are not calculated to do any material harm. But there are some who may receive his arguments as law, and practice after them inasmuch as they appear without dissent or comment by the editors of one of the foremost papers in the country. It is the giving publicity to the false teachings of such eccentric minds, that too frequently creates the objection to "Book Farming," particularly when they appear in such works as we have alluded to. We are pleased to see all important matters discussed, so long as argument is likely to throw light upon the

subject, with the prospect of improvement, but when the writer has no other object but to appear in print, and attempts to overthrow established principles by false reasoning, it is better for the public that he should remain silent.—
Valley Farmer.

Observations on the Physical Geology of the Western Districts of Canada.

BY CHARLES ROBB, C. E., HAMILTON, C. W.

From *The Journal of the Canadian Institute.*

(Continued from page 11.)

Details of the Rock Formations.—A very complete and most interesting section of the strata in a line running north and south, is afforded by the cutting on the line of the Niagara Falls and Lewiston Railroad, and by the ravine itself through which the great river flows.* Taking the section at this most interesting locality as the basis of our future enquiries, I shall proceed to describe briefly the component parts, and shall take occasion while it is under review to recapitulate the arguments of Lyell and others, to prove the fact of the retrocession of the Falls from Queenston Heights to their present site.

The strata in ascending order consist, first, of a soft red shaley and purely argillaceous marl, partially striped and spotted with green, seen in the bank of the river at Queenston and extending thence to Lake Ontario, and attaining a height of about one hundred and ten feet at the escarpment at Queenston. This formation, which is entirely devoid of calcareous matter, is regularly stratified, and interspersed with thin veins of a light green rock of similar composition though somewhat harder, the colors being evidently derived from the presence of iron. The traces of organic remains in this bed are very obscure though not altogether wanting, and it is chiefly remarkable as forming the base of the system, and as occupying the entire area between the foot of the slope of the mountain and the lake shore for the whole distance from the Niagara River to Oakville.

The second stratum is a bed of very hard light grey quartzose sandstone, marked frequently with ferruginous spots, but forming an excellent building material, and quarried extensively at Lewiston, Hamilton, Dundas and other places. This bed is about fifteen feet thick at Queenston, and contains the remains of fuci or sea weeds. I have also observed it to be distinctly ripple-marked in some localities. Above this for a thickness of about sixty feet occur alternate layers of red shale or marl, similar to No. 1, and

of sandstone or limestone, the former principally near the top of the formation. The harder rocks here are particularly rich in organic remains, some in a beautiful state of preservation, and all remarkably characteristic of the geological epoch to which these formations belong, consisting of corals, brachiopods of various species, tentaculites, euerinites and trilobites. Of the trilobites, a remarkable crustacean genus strikingly characteristic of the Silurian system all over the world, I have only detected a few fragments, but they are sufficiently unequivocal.†

Next in succession is a grey and mottled sandstone about fifteen feet thick, forming the upper member of what is called by the New York State Geologists the Medina Sandstone group. Euerinites, corals and broken shells prevail in great abundance at the top. Overlying this bed is a band of light green shale five feet thick, turning into clay on exposure to the atmosphere. This stratum forms the lower member of the Clinton group of New York, and is remarkable as being traceable for vast distances east and west in precisely the same relative position, and of identical mineral character. Next in order occurs a compact bed of light grey, very hard limestone, about sixteen feet in thickness, copiously charged throughout its entire mass, but chiefly towards the top with the bivalve shell *Pentamerus* (a genus also found extensively in a corresponding position in the Silurian systems of England and Russia) as also with a few species of *Atrypa*, a remarkable coral called *Favosites gothlandicus*, &c. This bed forms the upper member of the Clinton group, and wherever it is found is an exceedingly handsome and durable stone for building purposes. Owing to its hardness it forms a distinct escarpment wherever exposed for any length of time to the weather. Then follows the formation usually denominated Niagara shale, about eighty feet thick, consisting of a homogeneous stratified or laminated mass of bluish-grey, sometimes nearly black, argillaceous, arenaceous and calcareous slaty rock, hard and solid in the bed, but decomposing and crumbling when exposed to the atmospheric influences. It seems to be devoid of fossils, except towards its junction with the underlying hard limestone, where it is plentifully charged with *Pentamerus* and *Atrypa*.

Lastly, the escarpment is capped by the Niagara limestone, (so called) a massive and very hard dark blue or more nearly black rock, the lower portions being in very thick solid beds, while towards the top the partings occur more frequently. This rock is magnesian and silicious in mineral character, and is highly bituminous, being known in many places to emit inflammable gas through the seams. Occasionally it is cavernous in structure, and is copiously interspersed with druses or cavities containing calc-spar, gypsum and sulphate of Strontian. I have been unable to detect any fossil remains in this forma-

*This section is represented graphically in Sir Charles Lyell's *First Visit to the United States*, 1831-2, Vol. I. page 36, to which we would refer our readers.

tion, although I believe they are not altogether wanting. It is over this rock that the great cataract is precipitated, and it forms from its hardness a species of coat of mail or armour of proof to resist the too rapid erosions of the torrent.

Proofs of Retrocession.—It will serve at once to illustrate strikingly what may be called the mechanical properties of the strata we have been considering, and at the same time to show by a most remarkable example the value of geological evidence in regard to duration of time, if we take up at this stage the subject of the recession of the great Falls.

It has long been a well known fact, that behind the mighty cataract there existed a vast cavern formed by the action of the water and air set in violent motion by the descending torrent upon the soft shales underlying the Niagara limestones; and this fact must have suggested to an enquiring mind the idea, that as the soft material became gradually undermined or excavated, the weight of the superstructure and impetus of water must have caused the harder superincumbent rock from time to time to give way, and thus occasion a recession of the Fall in its position. In accordance with this idea, it is found from historic evidence, (which unfortunately in this point affords less corroboration to geological theories than in questions relating to the old world), that changes of the kind referred to had actually taken place: and the appearance of the bank below the Falls where these changes had occurred within the memory of man is so precisely identical in character with the whole gorge for seven miles below, that a philosophical observer of the phenomena of nature would be irresistibly impelled to the conclusion that the great Fall formerly existed at Queenston, and that the river must have sawed its way through this whole distance—provided sufficient time were allowed for the completion of the work. Sir Charles Lyell concludes, after the most careful and repeated investigation of the recorded facts, as well as the varying nature of the strata, that the average recession was not more than one foot per year, and that consequently it must have taken 35,000 years for the retreat of the Falls from the escarpment at Queenston to the present site. It seems by no means improbable that such result would be no exaggeration of the truth, although we cannot assume that the retrograde movement has been uniform. At some points, owing to the greater softness of the strata and the lesser width of the ravine, it might be expected that quicker progress might be made; but on the other hand, it must be observed that at the commencement of the process the Fall must have been nearly twice its present height and consequently the amount of material to be excavated proportionally greater. This estimate of the time required for the scooping out of the gorge, as Hugh Miller remarks, is based upon exactly the same process of reasoning by which one would infer that

a labourer who had cut a ditch two hundred yards long at the rate of ten yards per day and was still at work without intermission, had begun to cut it just twenty days previous.

This theory based upon historical, is amply corroborated by geological evidence. If we examine the structure of Goat Island, between the American and Horse Shoe Fall, we shall find that the superficial deposit consists of regularly stratified horizontal fresh water beds of gravel, sand and loam, in all about twenty feet thick, copiously charged with shells of the same species as now inhabit the waters of Lake Ontario and the Niagara River. These beds are entirely above the level of the water as it precipitates itself into the mighty gulf. Precisely the same formation will be found on the American side of the river exactly opposite, and extending for a considerable distance below the Falls on the top of the cliffs, and bounded towards the east by a distinctly traceable ancient river terrace cut out in the clay or drift formation which covers the whole country. This deposit, in which also the remains of a Mastodon have been found, occupies the place which the ancient bed, and alluvial plain of the Niagara would naturally have filled, if the river had extended farther northwards at a level sufficiently high to cover the greater part of Goat Island. At that period the ravine could not have existed, and the river must have been dammed back several miles lower down. The old river banks are distinctly traceable facing each other on both sides of the gorge, at least as far down as the Whirlpool, and vary in width from about thirty to three hundred feet from the brink of the precipice. At the summit of the cliffs overhanging the Whirlpool on the American side, there occurs a deposit forty feet thick of fluvial strata, precisely identical with those on Goat Island; and it must be borne in mind that nowhere do these deposits extend, or can they be traced, beyond the old river banks.

Here then we have the most unequivocal evidence that at a date comparatively modern in the geological epochs, though very remote as regards the history of our race, the great Falls must have been situated at least four miles below their present site; and in the absence of distinct traces of their existence still further northward we may reasonably and justly infer that they must have primarily been situated at the escarpment at Queenston. There is no ground for supposing that the excavation was assisted by an original rent in the rocks, and no appearance of a fissure occurs at the present site of the Falls.

The dip of the strata being twenty-five feet to the mile southward, and the slope of the river bed about fifteen feet in a mile northwards, these two inclinations combined have occasioned a diminution of forty feet in the perpendicular height of the Falls for every mile that they have receded southwards. When they were situated at the Whirlpool, the hard quartzose sandstone

was at the base of the precipice, and here the cataract may have remained stationary for ages. Even now the obstruction occasioned by this ledge in the bottom of the river causes a partial damming back of the water, which, overleaping this barrier, rushes with still more fearful velocity down the gorge. This phenomenon, together with a remarkable break (which I shall afterwards advert to) in the continuity of the strata on the Canadian side at this point have no doubt given rise to the Whirlpool. In regard to the future retrocession of the Falls it is susceptible of clear proof that when they have travelled back two miles or opposite to the village of Chippewa, the massive Niagara limestone now at the top will then extend also to the base of the Falls, and its great hardness will probably arrest the excavating process, if it should not have been previously stopped by the descent of larger masses of the same rock from the cliffs above. In this latter case, instead of a fall we shall have a rapid of about the same slope as the present rapids above the falls, (fifty feet in three-fourths of a mile); but very much more broken and irregular owing to the greater size of the masses of rock forming the bottom.

The next question to which we are naturally led, relates to the origin of the Falls, but this subject I shall defer till the close of this article, when, after describing the principal geological features of the region bordering on the head of Lake Ontario, I shall attempt to indicate the succession of events which have produced them.

Agricultural Intelligence.

HOW CARROTS AFFECT HORSES.—The carrot is the most esteemed of all roots for its feeding qualities. When analyzed, it gives but little more solid matter than any other root, 85 per cent. being water; but its influence in the stomach upon the other articles of food is most favourable, conducing to the most perfect digestion and assimilation. The result, long known to practical men, is explained by chemists as resulting from the presence of a substance called *pectine*, which operates to coagulate or gelatinize vegetable solutions, and this favours digestion in all cattle. Horses are especially benefited by the use of carrots. They should be fed to them frequently with other food.—*American Stock Journal*.

SALTING WHEAT IN THE MOW.—W. P. Cooper, of Lancaster, Pa., in an essay on Cutting and Harvesting Grain, published in the *Farmer and Gardener* says, in storing wheat in a mow, he commences on one side, places the sheaves in regular layers with the butts outside, tramping heavily on the butt of each as it is laid down.—The next layer is placed with the tops lapping about half way over the first, care being taken to keep the heads or tops uppermost. When

the entire space of the mow is covered in this way, common ground salt is sprinkled all over the mow on the top of the layer, at the rate of four quarts to every twenty dozen sheaves of wheat—a larger proportion of salt if the sheaves are very large. During the sweating, the salt is dissolved and absorbed by the grain and straw. The effect of this practice has been, to make the grain brighter and bring two or three cents more per bushel, than that which was not salted.—Millers say the yield of flour is larger and whiter. Cattle eat the straw freely? It is a most effectual remedy against the barn weevil. Experience has *proved* this to be a fact.

[This mode of storing wheat in barns is much practiced in England, but we have never seen salt applied. The benefits above mentioned seem highly probable, and can easily be tested. The shaft and straw will no doubt be more relished by cattle in consequence of the salt.—*Ed.*]

HOW TO SAVE MANURE IN WINTER.—A correspondent of the *New England Farmer* gives the following practical and sensible directions: "It is not every farmer that has a good cellar under his barn, but every one should have a wheelbarrow upon which he can carry the manure from the stable into the barn yard, and beginning on one side of the yard, dump one load in a place till he has covered the whole surface, or as much thereof as he pleases, then go over with another course in the same way, and so on through the winter, and in the spring he will find the droppings of the cattle well mixed with their bedding and the litter of the yard, and no unsightly heap under his stable windows. If he has sheds for his cattle or sheep under which he can deposit as above, so much the better."

[The advice in the last sentence is most important. Manure should be collected as far as possible *under cover*, sprinkled over with the urine of the animals. When exposed to rains it loses much of its ammonia and most valuable salts.—*Ed. C. A.*]

IMPORTATION OF PURE BRED ARAB HORSES INTO THE UNITED STATES.—The Hon. Governor Seward has imported from Syria a Stallion, 7 years old, and a 2 year old colt, which are said to be of the best blood in the Arab race. The offspring of the older stallion are described as excellent; the charge for covering each mare in his native country was *five camels*; the value of which is said to be from \$80 to \$100 each; showing the value put upon this horse in Arabia. The introduction of pure Arab blood among the best class of our mares on this continent cannot fail to be advantageous, and we hope ere long to receive some benefit here in Canada from such enterprises.

SOUTHDOWN SHEEP.—We learn from our American exchanges that Mr. Samuel Thorne, of Dutchess County, New York, is now in Europe selecting Southdown sheep for his splendid flock. His first importation, comprising one ram and ten ewes, has reached New York in safety. The animals are all from the breeding flock of Mr. Jonas Webb, and are said to be the most superior and expensive lot that probably was ever imported. The ram won the first prize in his class at the Royal English Show at Canterbury last summer; and, having attended that meeting, we have a very distinct recollection of Mr. Webb's animals, which were superior in point of size, symmetry, and high breeding to anything we ever saw. In fact Webb seems to have reached perfection in this his favorite class of sheep. It is said that the ram cost Mr. Thorne *twelve hundred and fifty dollars* in England, and that at this enormous price the purchaser congratulates himself on the acquisition! We saw no Southdowns afterwards, neither at the Irish or Scotch Shows, that would compare for a moment with Mr. Webb's unrivalled sheep. We heartily wish Mr. Thorne every success in his praiseworthy enterprise.

SYSTEM OF AGRICULTURAL INSTRUCTION IN BELGIUM.—After discussing and agitating this question for many years, the Belgian Chambers have at length passed a special law for the organization of the system of teaching Agriculture.

The following establishments are founded for the purpose by the State, or with its assistance:

- A. A Veterinary School.
- B. An Institute of Agriculture.
- C. Two Schools of Practical Horticulture.

The course of instruction in these will be as follows:

A. Veterinary School:—Natural philosophy, chemistry, botany; descriptive and comparative anatomy of domestic animals, general anatomy; physiology, materia medica, pharmacology and general therapeutics; general pathology; pathological anatomy, special pathology and therapeutics, pathological surgery; *zootechnie*, embracing hygiene, breeding and rearing of domestic animal; sanitary discipline, medical jurisprudence, farriery, surgery, obstetrics, and clinical medicine and surgery.

B. Agricultural Institute:

Rural Engineering, embracing geometry, stereometry, surveying and tracing, taking of levels, linear drawing, drainage, irrigation, agricultural implements, and rural architecture;

Physical and Chemical Sciences, embracing natural philosophy, meteorology, chemistry, chemical analysis and manipulations, and agricultural technology;

Natural History, embracing mineralogy, geology, botany, and zoology, applied to agriculture;

Zootechnie, embracing animal anatomy and physiology, hygiene and the breeding, rearing and management of domestic animals;

General and special agriculture;
Rural and forest economy, rural jurisprudence, and knowledge of farm accounts:

Practical agriculture and horticulture.

C. Schools of Practical Horticulture:

French and Dutch languages, arithmetic, construction of greenhouses and garden works; botany, theory and practice of horticulture, and accounts.

The course of study at the Veterinary School will extend over four years, and at the Institute of Agriculture and the Horticultural Schools will be limited to three years.

With such a course of instruction, and a full staff of able professors, it will only be necessary in order to insure success, that the candidates should possess a solid education. This rule, so often overlooked in special schools, will, it is to be hoped, be enforced by government.—*Revue Populaire des Sciences.*

Horticultural.

Fruit Growers' Society, Western New York.

Editor of Canadian Agriculturist.

DEAR SIR,—I send you herewith an abstract from my notes of the proceedings of the Fruit Growers' Society of Western New York, at their meeting held on the 9th and 10th of January, 1861, at the City of Rochester, of which not a little will be found of interest to growers of fruit in Canada. A full account of the proceedings of the Fruit Growers' Association of Upper Canada, at their last meeting held at Hamilton, on the 16th and 17th inst., will be furnished you by the Secretary for publication in your valuable journal. It is to be hoped that all growers of fruit in Canada will take an interest in their Fruit Growers' Association, and that thus the varied experience of cultivators in the different sections of our Province will be brought together in a form calculated to be of lasting benefit to our country. It is a noble country, possessing vast and varied resources, among which its fruit growing capacities are of considerable importance, requiring only to be fostered and intelligently developed to contribute largely to the comfort, health, and wealth of our people.

Very truly yours,

D. W. BEADLE.

St. Catherines' Nurseries, Jan., 1861.

**FRUIT GROWERS' MEETING, HELD AT
ROCHESTER, JAN. 9TH AND 10TH, 1861.**

The following subjects were prepared by a committee, and presented to the meeting for discussion, of which discussion those noted will give the more important points.

SUBJECT 1. The best method of gathering, packing and transporting pears to market.

Dr. Sylvester, of Lyons. The fruit should be fully developed, but gathered before severe frosts, handled very carefully, allowed to sweat, then packed in half barrels, gently jarred many times while filling, headed up tight so that the pears can not move, and sent to market near the time of ripening. In case of tender varieties, should wrap each pear in paper.

Mr. P. Barry, Rochester. In gathering Winter pears, the fruit should be picked before the leaves fall, carefully, by hand, assorted and put in a cool, airy place, dry and free from frost. Placed his on a barn floor, and covers them deep with leaves to preserve them from frost, and when the thermometer begins to fall very low, removes them to a cool, dry cellar. Well matured pears will ripen finely at 40° Fahrenheit; it is not necessary to bring them into a warm room.

Mr. H. E. Hooker. Did not think it necessary to take so much pains in spreading the fruit out on a floor and covering with leaves; would place the fruit in "half barrels," (not a barrel sawn in two,) with holes bored in the head, keep out of the cellar in a cool, dry, airy place, until very cold weather, until they were in danger of being frozen if left there longer, and then remove to a cellar where the thermometer would stand at about 40° Fahrenheit.

2d SUBJECT. The best method of preserving fruits so as in any way to prolong the period of consumption.

Mr. H. E. Hooker. Thought fruit could not be kept fresh much beyond the usual period of maturity without impairing its flavor.

Mr. Sharpe, of Lockport. Had on exhibition some Bartletts, Louise Bonne de Jersey, Swan's Orange, Seckel, and Beurre Diel, which he had kept in the green state, but as he had not perfected his experiments, he did not wish to say how he had preserved them. These pears had been taken from the tree after they had attained their full size, but before they had begun to ripen, and were now, Jan. 9th, as hard and green as when first gathered. The ripening process seemed to have been entirely suspended.

Mr. H. N. Langworthy. Had kept Bartletts from ripening by wrapping each pear in paper, and then enclosing them in a tin box closed up tight, and immersing them in the ice of his ice-house.

Mr. W. P. Townsend. Had kept them by wrapping them in paper, then tying them up in a woollen cloth and setting them on the ice in his ice-house; they kept perfectly sound, but

soon discolored on exposure to the air, and were insipid.

Mr. P. Barry, of Rochester. The ripening process of pears if suspended long will never be redeemed. If ripe they may be kept a short time, but if kept long will lose their flavor. Fruit rooms should be above ground, cool and dry, kept as near as possible at 40° Fahrenheit, so as to let the ripening process go on, but very slowly.

Mr. Smith, of Geneva. Had kept plums and other early fruits in boxes, set into the saw-dust of his ice-house, but they all lost their flavor and were worthless.

Dr. Tobey, of Rochester. Exhibited some Catawba, Isabella, Diana and Clinton grapes, which he said were picked about the first of November, put into small paper boxes, 8 x 12 inches, and 4 inches deep, holding about five pounds each, and placed in a dry, cool cellar.

Mr. H. N. Langworthy. Keep grapes until May in peach baskets, a layer of grapes and of paper alternately, having care to put in none but sound grapes.

Dr. Sylvester, of Lyons. Prefers to have grapes fully ripe; take out all that are green or bruised, and pack immediately, having the grapes dry, in a dry day, in shallow paper boxes, not more than two layers in each box, with white bibulous paper between, and keep in a dry, cool room up stairs until there is danger of freezing. The Clinton kept very well until into March, and had a very sprightly flavor. Isabella keeps, but not with so sprightly a flavor.

Mr. Chas. Downing, of Newburgh. Had tried nearly every way to keep grapes, but had not succeeded.

Mr. Barbour, of East Bloomfield. That in his vicinity he had known 30 tons of grapes packed, but that they always *cure* the stems before packing to prevent them from moulding. They have a drying house in which they have no fire, except enough to keep out frost; the grapes are spread out on shelves, thoroughly ventilated, and kept from two to four weeks. The grapes do not shrivel at all if fully ripe, in this process of curing the stems.

Mr. Larrowe. Would cure the stems by placing the grapes in half barrels, covering the top with paper, which is removed as often as it becomes damp. Packs about five pounds in each paper box.

3d SUBJECT. Can the yellows in the peach be introduced by the importation of trees from infected districts?

There was considerable discussion on this subject, Mr. Chas. Downing, maintaining that the disease was contagious, Mr. P. Barry holding the opposite opinion.

4th SUBJECT. Which is the best stock for the cherry for general purposes, the Mazzard or Mahaleb?

Mr. W. P. Townsend, of Lockport. The Ma-

haleb is hardier and healthier; the wood is harder.

Mr. Ellwanger, of Rochester. The Mahaleb adapts itself better to different soils, particularly clayey soils. Some varieties when worked on the Mazzard are apt to crack in the bark, and the gum to exude, such as the Black Tatarian; and these we now work exclusively on the Mahaleb, on which stock they are not subject to this disease.

Mr. Chas. Downing, of Newburg. The cherry on the Mahaleb stock is much better for the north and west.

5th SUBJECT. The Northern Spy apple, what is its value as an orchard fruit?

Mr. P. Barry. This subject was introduced at my suggestion, as I wished, now that we had considerable experience, to ascertain the views of orchardists in relation to it. It has been charged with being a shy bearer, that a large part of the fruit is small and knotty, and that it would not keep. Now not one of these charges have been sustained by my experience. I think the Spy is improving in value and quality every year; that it is the best of all the apples, both in flavor, size, beauty and perfume; but it is my desire to hear the experience and opinion of others.

Mr. Sharpe, of Lockport. Picked four barrels from his tree in 1859, and five in 1860; they were unsurpassed in flavor, and those of 1859 kept fresh and fine until April and May.

Mr. H. T. Brooke, of Wyoming. My trees have been now planted five years, and bore this year for the first time.

Mr. A. Fish, of Rochester. Thinks the tree slow in coming into bearing; that those who must have their apple trees bear the next year after planting will be disappointed, but if they will have patience to wait a few years, they will be abundantly satisfied.

Mr. Hoag, of Lockport. As to their keeping qualities would say, I have found them in the New York City Market in June, side by side with the Rox Russet. The Chicago dealers seek eagerly for this variety.

Mr. Smith. Has only one tree; it bore nine barrels this year.

Mr. Barbour, of East Bloomfield. The Northern Spy originated in East Bloomfield, on the farm of Mr. Humphrey. I have known the apple for 25 years. It is thought to be one of the best keepers and very best of apples. A great many orchards have been grafted with the Spy in my County, and the result seems to be, that in the part where the land slopes south, and where the soil is dry, gravelly loam, the Spy is a very great favorite and the tree in great demand; but where the land slopes north, and where the soil is stiff and cold, the Spy is not so popular. I know some trees that must be now 75 years old; and when old, the tree needs to be well thinned out and manured. The fruit keeps

until June; but it is easily bruized and difficult of transportation in a fine state to market. The Spy often escapes late frosts, which destroy the crop in other varieties, by reason of its putting forth its leaves and blossoms so much later than other varieties.

Dr. Sylvester. My trees did not bear full crops until they had been set out from 8 to 10 years, but I esteem the fruit highly for its flavor and long keeping.

Mr. E. Moody, of Lockport. I think the Northern Spy to be the best apple that ever grew. I have known them growing on a low, moist sand and on a stiff clay, and they bore fine large crops of splendid fruit. I esteem it a most valuable fact that the tree blooms late, thereby often escaping late frosts.

D. W. Beadle, of St. Catharines, Canada. Had found the fruit very uniform in size, large, very handsome, and to hang unusually well on the tree, so that the Spys yet remained, notwithstanding high winds, which had blown off other varieties almost entirely.

Mr. P. Barry. All apples are best on a warm, dry soil, and require judicious pruning; and if the Spy needs rather more care than most varieties, it is enough better than any other to pay for it. The tardiness in coming into bearing is in reality no objection to it whatever, the tree only gains size and strength to bear a full crop. I am now fully satisfied, after hearing what has been said, that my opinion of the Spy was correct, and that with a fair amount of care it proves to be the *finest and most desirable of apples*.

Mr. H. N. Langworthy. The Spy has some faults; the tree is prone to grow too high, and the fruit requires very careful handling, for it is as thin skinned as a South Carolinian, but it keeps its fine spicy flavor longer than any other apple.

6th SUBJECT. Is it advisable to plant in Western New York the White Doyenne pear for orchard purposes, in view of its present liability to crack and spot in certain localities?

As this best and most valuable variety of pear has not been known to crack at all in Canada, it will hardly be necessary to go into the details of the discussion. From the testimony given, it appeared that in the vicinity of Rochester and Lockport this variety was nearly worthless for market purposes on account of the cracking and spotting of the fruit, while in the vicinity of Canandaigua and Geneva, it was entirely exempt from this malady, and the fruit fine and fair. It may be a matter of some interest to our fruit dealers, who import pears to supply the market of our cities, to bear this matter in mind when arranging for their next fall's supply.

7th SUBJECT. What is to be understood by the term, a *standard*, and what by the term a *dwarf* tree?

The discussion on this subject resulted in the conclusion that in using the term "*dwarf*,"

the nurserymen and intelligent purchasers understand a tree that has been worked upon a stock of a dwarfish habit of growth, thereby lessening the tendency of the tree to grow large and inducing early and greater fruitfulness. In the case of the pear this is accomplished by working, (that is grafting or budding) the pear on a quince stock, and in the apple, by working it on the paradise stock; and so of other fruits. The term "standard" was used in contradistinction from "dwarf," meaning a tree worked on a stock that allowed of the full and normal development belonging to its kind, as the pear on a pear stock, the apple on the common apple stock. Some persons have very erroneously supposed that a "dwarf apple" was a peculiar kind of apple, of small size in both tree and fruit, but it is not so; we call the Rhode Island Greening or the Northern Spy, a "dwarf apple" when grown on the Paradise Stock, by which means the tree only is made smaller, but the fruit grows to its full size and excellence; and in some instances, particularly pears, the fruit grows to a larger size and acquires a higher flavor than when grown on "standard" trees. Some persons are in the habit of calling a tree that is pruned so as to form a low head, "a dwarf;" and this use of the term is very likely to mislead and induce people to expect from such a tree a small growth and great fruitfulness, only to be disappointed.

8th SUBJECT. What influence has the stock upon the graft, in modifying or changing the quality of the fruit?

No person present having conducted any experiments sufficiently accurate to throw any light on this question, it was laid over for consideration at a subsequent meeting.

9th SUBJECT. In transplanting trees, is pruning the tops and roots of importance, and if so, under what circumstances?

Mr. Barbour, of East Bloomfield. I cut away a good deal of the top so as to make it correspond with the cutting of the roots that necessarily takes place in digging up the tree; and pare smooth any bruised or mangled portions of the root.

Mr. Herendeen, of Macedon, had tried an experiment last spring bearing on this question. He had planted a lot of trees alike in all respects, except that a part he did not prune at all; another third he pruned—in some, and the other third he pruned—in close; and those cut in closest lived and grew the best.

Mr. P. Barry would, by all means recommend that the tops of the trees be well pruned back in order that the tree thrive well on being transplanted; and if the fibres of the roots have become matted together, would cut them away sufficiently to let the earth be easily and thoroughly worked among the roots in setting out.

Mr. Sharpe, of Lockport, in transplanting ear trees is in the habit of cutting off all the

top, leaving only about 18 inches of the trunk or stem of the tree, and finds that the trees live and grow best when treated in this way.

The time fixed for adjournment having arrived, the Society adjourned to meet at Syracuse, at the call of the Council.

Veterinary.

The Relation of Veterinary to Social Science.

Concluded from our last.

The alleys and closes of Edinburgh are often complained of. It is notorious that in many parts typhus is a constant disease, clearing out numbers of the miserable poor who huddle together wherever they can procure shelter, a shelter poisoned not only by the filth and foul emanations dependent on the congregation of human beings, but surrounded by the darkest, dirtiest, and most unhealthy cowsheds, with all their disagreeable appurtenances. One person, once a flesher, is expected, as I stated in 1847 to the then Lord Provost of Edinburgh, to be in attendance daily in the dead-meat market, to visit butchers' shops, be on the look-out at railway stations for carcases coming in from the country, call twice daily at the police office, and is likewise expected to draw up a report (which it is not in his power to do), giving the number and state of the byres and their inmates, to visit thereafter these byres, see if any sick animals are in them, and should he find any, to watch them narrowly, to ascertain how their carcases are disposed of. Gentlemen, the case is worse now than in 1857, because I can assert, on the best authority, that the Inspector appointed for the slaughter-houses proved incapable of judging the carcases; and the dead-meat market inspector, on whom devolve the above duties, has in addition, to attend daily, to do the duty of inspector at the slaughter-house, and judge any carcase submitted to him. In 1857, both inspectors had been fleshers. I believe I am correct in stating that now only one who has been changed since then, has been accustomed to the trade, and to judge meat. With regard to appointing fleshers as inspectors, I said in 1857, in a letter which I addressed to the *Scotsman*:—

1st. It would not be difficult to prove that as fleshers they are rather disqualified than rendered fit for the office of inspectors, being accustomed to certain practices peculiar to such trade, which almost precludes them having a strict and unprejudiced notion of what is really lawful and justifiable, and what is not. 2nd. All those conscious of the difficulty of *post mortem* examinations and the recognition of morbid lesions, must give evidence to the effect that a scientific

man can alone undertake the task of determining the nature and importance of appearances in the dead bodies of diseased animals. I need insist but little on this point; but as proof, I may mention having observed extravasations of blood and acute phlegmons occurring in the malignant "black quarter" of cattle, looked upon as simple bruises, and the carcasses passed as wholesome, the animals being young and fat; and the tubercles characteristic of phthisis passed over as unimportant, because of common occurrence, and, provided the meat was marketable—viz., fat enough—the diseased parts were cut away, and the carcasses sold."

This subject, gentlemen, is one which has interested me since the days I was a student in the London Veterinary College, when I wandered around the London dairies, and saw the disgusting practices incidental to the sale and consumption of diseased cows:—how the most filthy products of disease were hashed up with other meat, equally unsightly and unpalatable, to make sausages; how a lot of the carcasses of cows were polished, and dressed up with the fat of two or three fat young bullocks killed with them; and how the flesh of diseased animals not only found its way to the poor man's home, but to the table of the middle and upper classes from the quarters sold to the butchers who could not kill enough weekly for their own consumption. Edinburgh people may be gratified by the knowledge that most of the bad carcasses are trucked to London; but every person with the slightest regard for decency and humanity must revolt at the unmitigated evil which I have striven to expose.

There are difficulties in the way. They are so numerous that the champions to face them will not easily be found. The gratitude of the people would reward any public man who would seriously consider the question. No city offers better opportunities for a rigid system of inspection than Edinburgh, and only one objection exists, viz., its expense. This would be comparatively trifling; and I wish to ask, where is the person who would resist the infinitesimal tax upon the price of each stone of meat sold in Edinburgh, to ensure, so far as science can ensure, that the meat dressed daily for dinner is the *bona fide* nutritious food to be derived from healthy stock? The influence on Veterinary science, by the opportunities which the office of inspector would give to the Veterinarian, would soon be very obvious; and the persons required for such offices needing a better acquaintance with pathological anatomy and disease in general, than is usually possessed by students in leaving College, would compel many to work longer and harder in their profession than it has been usual to do.

I hail with pleasure any movement which turns public attention to our profession, and none would prove its public importance more than the

judicious employment of veterinarians, as above stated. That the services of the veterinary surgeon are appreciated, is amply testified by the vigorous steps taken at present in Ireland to establish a Veterinary College. On that subject I have expressed a decided and favorable opinion, though I have already observed remarks in public journals condemning the project. The reason assigned is, that Irish students would benefit by contact with Englishmen and Scotchmen in the Veterinary Colleges of Edinburgh and London. I have distinctly declared that great difficulty must be experienced in procuring teachers from the imperfect system of veterinary education followed out for the past; but a college in Dublin would undoubtedly give an impulse to the study of the science of Comparative Pathology—would attract more to the profession to practice as veterinarians in Ireland, and would greatly strengthen the veterinary profession.

On various occasions my advice as to the establishment of an Irish College has been sought; and during the past week Professor Cameron of Dublin has favored us by a visit, to ascertain the best means of accomplishing this object. I believe that, in accordance with suggestions of my own, the young men devoting themselves with great assiduity to their studies during the forthcoming year, may look forward to compete for positions which will be awarded according to merit after a most rigid test.

The New Veterinary College is young in years, but, thanks to many favorable circumstances, it is sound in foundation, and is already fairly launched in an independent path of progress, in which it can with pleasure contemplate the co-operation of another institution, started with young and vigorous blood, to bear up in the hard race for simple sustenance in which it will have to run.

In my introductory lecture, in 1858, I mentioned how scantily Scotland, but more particularly Ireland, was supplied with veterinary surgeons. What a contrast when compared to the German States, in which our profession stands higher, as being more learned, than any other part of Europe! There are colleges in Berlin, Dresden, Vienna, Wurtemberg, Munich, Carlsruhe, besides other professors of veterinary science in the different universities. It prospers; and we find one veterinary surgeon for every forty or fifty square miles of surface. In Ireland should, therefore, have a veterinary college; but I wish the promoters of such an institution in Dublin to know that it is not a simple matter; and, unless the right men are secured at first, no amount of money can accomplish a worthy object they have in view.

I am particularly desirous to acquaint all the members of the projected school, for this one reason—amongst others, that intelligent young men, devoting themselves to the veterinary profession with a serious determination to become the

oughly proficient, can look forward to many opportunities for engaging as teachers. Great changes must occur in a very few years more, and for truly able men, whose ambition has a certain limit, no profession offers a fairer prospect of success. It is true that he cannot look forward, like the medical man, to the prospect of a baronetcy, or, like a lawyer, to sit on theoolsack; but he can hope for as much honest ratification as an earnest worker in a most useful calling as any person need reasonably covet.

I know of no greater reward than that incidental to the conscientious discharge of professional duties; and the zealous teacher certainly experiences as large a share of this class of enjoyment as any other person. There are, however, any ways in which the straightforward dealings of a professional man are rewarded, and the veterinary surgeon is placed, perhaps in a more delicate position, between persons of conflicting interests, than the number of any other profession. I need scarcely say I am alluding to many circumstances under which the veterinarian becomes a professional arbitrator—an adviser in the most delicate of all speculations, the purchase of a horse—a peace-maker, if possible, between men of the most opposite classes, some tending on their dignity, others keenly enjoying an intrigue, and all, perhaps, unreasonable, because not capable of fully understanding the nature of the real causes which create doubts and disputes.

It is often a thankless task to examine a horse to soundness. A purchaser has found what he has been seeking for months perhaps; acting cautiously in horse transactions, and probably asked an exorbitant price for the object of his choice, he desires to consult the veterinary surgeon. The horse is rejected, the purchaser is disappointed, and the dealer sadly displeased. An inclination on both sides to think the veterinary surgeon may be a little too strict, induces departures from his advice, and, in the course of time, when unsoundness is very manifest, appeal to another professional man, and this often leads to a long and expensive lawsuit.

The veterinary surgeon who is most skillful and conscientious in detecting unsoundness, is the one who necessarily experiences the greatest delicacy in these matters, and who meets with most severe opposition on the part of those who care not to be impudently honest. The motto of such persons in the horse trade is, "Make money honestly if you can, but, at all events, make money." As a Roman satirist says, *Rem facias, bene sis; quocumque modo rem*. It so happens in live-stock is the most precarious of all seek-in-trade. The nature of the article sold is variably the subject of grave suspicion, and reasons are not content until they have discovered some flaw. There are usually dozens of reasons prepared to express their opinion on the subject; and every one who has frequented

a stable any number of years is recognised as a qualified judge in horse matters. It is very clear that the veterinary surgeon has, as much as any professional man, full scope for an honorable, discriminating, prudent, and skilful exercise of his own judgment. Amongst the relations of veterinary to social science, I would class this as the relation of veterinary science to the science of moral duty. The patience of the professional man is severely tried in this branch of his calling. He is sure to displease some one; and when temptation is yielded to—a timeserving policy being adopted—it is often from a desire to serve the individual who has most in his power, or who, on the plea of friendship, claims to be dealt leniently with.

I must honestly aver, that since I have established the new Veterinary College, I have as much reason to feel satisfied with the discharge of this part of our duties as any other, though a firm and consistent line of conduct has met with the most determined opposition from many who fancy we might overlook small things, and declare animals sound or unsound, rather as it suits the circumstance than as it agrees with the facts before us in each case.

I purposely allude to this subject at some length to-day, because our experience is of some value to the veterinarian who commences practice. When formerly in practice elsewhere, I did not meet with the unsatisfactory and underhand opposition which I have met here; but in the city of Edinburgh, whether I pronounce a horse sound or unsound, several opinions diametrically opposite to mine are immediately obtained. Of this I am certain, that it is not a difference of professional judgment so much as an unworthy difference arising from rivalry, inasmuch as the most obvious cases of unsoundness have passed muster after receiving my unfavorable verdict. I have the greatest satisfaction of being able to prove, in every instance that I have yet traced, that I have not erred in judgment; and I may allude to two or three interesting cases of this description.

In the very earliest days of the College a horse was brought to me to be examined. I at once rejected him as bad roarer. My advice was sought by an intelligent purchaser, who, having tried the horse, liked him because he was very quiet and steady. He at once stated to the vendor that I had rejected the horse, whereupon another veterinary surgeon was consulted, and pronounced the animal sound. Hesitating whether to buy or not, my client waited a day or two, when the animal was set up to auction, and, evidently by means well known in the horse-trade a keen bidding was started, and the animal was knocked down, to my friend, for £45. The horse was taken to the country, proved to be a roarer, and it was then discovered that this precious gem was a cast-off trooper which had realized £7 at the hammer not long previously.

The second case was one of peculiar interest, and it has been only within the last fortnight that I have obtained decided testimony that my father's opinion, who first examined the horse, and in whose opinion I subsequently concurred, was perfectly correct. A baronet honoured us by reference on the occasion of purchasing a pair of horses. One my father found a year younger than he was pronounced to be, and the other, a five-year-old horse, to have defective hocks, particularly the near one, and the defect chiefly consisted in slight enlargement in the seat of well-known disease, "spavin," with want of elasticity in the movements of the joint. I unhesitatingly condemned him for spavin. The hon. baronet stood by our opinion, and a very handsome chance for the dealer was lost. I cannot precisely say how many veterinary surgeons immediately declared this animal sound; but as good fortune would have it, the animal took ill shortly after and died. The hocks were boiled, and the bones kept, to be used in testimony against my father and myself. The horse-dealer positively refused that we should examine any more horses in his stable. This threat had been exercised before, and we were quite indifferent about the matter. Time rolled on, and during the last month an eminent veterinarian from the south of England told me that he had been conducted to a horse-dealer's yard, to be shown some hock bones which belonged to a horse we had, according to a veterinary surgeon's opinion, improperly condemned for spavin; but he found that we were perfectly correct. Another veterinary surgeon afterwards confirmed this opinion, and last week, on the occasion of my being requested to examine a horse I was told that I had erred before, and should not examine the animal in question. During the conversation the dealer volunteered to show me the bones, and I declared myself prepared at once to avow error, in the event of proof being afforded me, that we had erred. It is remarkable and almost incredible, that both the hocks are diseased. Slightly, it is true, but even extending to roughness of the joint surfaces, as well as decided enlargement of the ridge on the cuneiform bones. It is true, that in a young horse, with slight spavin of the hock joint, the soft tissues alone might have been affected; but there is here positive deposition of bone, and unmistakable signs of disease of some standing. Gentlemen, it is perfectly possible for any one to err, but so careful are we, and we hope at all times so impartial, that I repeat we look back with great satisfaction to the way in which we have worked through this very delicate part of our professional duties. I state this in vindication of the practice and the principles of the New Veterinary College. I might multiply instances, but they are all of this class, and in two cases in which a lawsuit arose, and in which we had a decided proof in opposition to the result of the trial, after-experience con-

firms the correctness of our judgment. Fortunately, in the large majority of cases in which a decided opinion has been expressed, the verdict has been on our side; though in all law cases it is our rule to act as simple witnesses, and not, as is frequently done by scientific witnesses, to constitute ourselves advocates for the side on which we may happen to be subpoenaed.

But, gentlemen, though a fearless and honest course has unfortunately placed us in antagonism with many, I must say the soundness of our policy is proved by the best of all tests, and that is the degree of success in practice; and month after month has it increased, exceeding our most sanguine expectations.

We confidently look forward to the future. Beyond the small influence which I can exert for the honor and prosperity of our new Institution, there will be the combined influence of a body of our students, who will ever learn, we hope from the lectures in the New Veterinary College, that their profession is a noble and difficult one, and that with clear heads they must combat high principle, the sure and only pioneer in the business of life.

Transactions.

Abstract of Report of Agricultural Societies received in the year 1860.

(Continued from last volume, Page 506.)

[The publication of a condensation of these official reports has from a variety of circumstances been unavoidably delayed; we now proceed with the abstract, from the No of October 1st.—Ed.]

DURHAM EAST.

COUNTY SOCIETY.—Fifty-six members, amount of subscriptions, \$61; balance from 1858, \$71 62; deposited by Township Societies, \$287; Government grant, \$179 93; received from Hope Branch Society in aid of exhibition, \$250; entrance fees at exhibition, \$269 87; total receipts, \$1419 67. Paid Township Societies, \$574; paid in premiums, \$578 50; expenses and sundries \$137 41; balance in Treasurer's hands \$129 77.

Extract from Report.

Your Directors, with the assistance of balance, over from last year, were able to offer as large premiums as usual for competition at the Fall Show.

The sum of ten pounds was voted to the Township of Hope Branch Society to assist in getting up a Spring Show of Horses. O

the day of Exhibition few were on the ground, and those shown were declared by the Judges not adapted to this section of country. Your Directors feel that a great necessity exists for improving the breed of horses in this section of the Province, and would urge members to give the subject most careful and serious consideration.

In the spring a communication was received from the Board of Agriculture, informing your Directors that the Board had a quantity of superior flax seed on hand, which they had taken great pains to secure, for seed, and offering it for sale to the Society. Six bushels were purchased, and, although offered at cost, and widely advertised, only about three bushels were disposed of to members.

The Fall Show of the Society, held in October last, was not equal to its predecessor. The number of entries was not so great, and the falling off was general, not confined to any particular class. The out-door exhibition was small. The number of horses, cattle, sheep, and swine, being below what was expected, while the display of agricultural implements was comparatively even less. In the vegetable and grain department the show was excellent; the wheat and oats being, perhaps, superior to any ever before grown in this riding, while the potatoes, turnips, beets, carrots, cabbage, &c., were equally creditable.

TOWNSHIP BRANCHES.

CAYAN.—Fifty-four members, amount of subscription, \$54; balance from previous year, \$31 80; share of public grant, \$54; fees, \$6; total receipts, \$148 80. Paid in premiums at Spring and Fall Show, \$101; expenses, \$33 85; balance in Treasurer's hands, \$13 95.

HOPE.—One hundred and sixty-four members, amount of subscription, \$164 50; balance from previous year, \$132 10; share of public grant, \$163; total receipts, \$459 60. Paid Treasurer of County Society for purposes of joint exhibition, &c., \$274; paid for copies of *Agriculturist* for members, \$75; incidental expenses, \$35 60; balance in Treasurer's hands, \$75.

Extract from Report.

Your Directors have started a Club in the Township for the discussion of subjects con-

nected with Agriculture, and they are of opinion that much good would result if farmers would more generally attend its meetings.

Your Directors appropriated \$250 towards holding a joint exhibition with the County Society, and believe the money better expended than if they had held a separate exhibition.

WEST DURHAM.

COUNTY SOCIETY.—Eighty-seven members; amount of subscription, \$87; balance on hand from previous account, \$25.96; deposited by Township societies, \$271; Legislative grant, \$478.98; total receipts, \$862.94. Amount paid Township societies, \$57.9; paid in premiums, \$292.50; expenses, &c., \$32.10; balance due Treasurer, \$50.66.

Extracts from Report.

Your Directors have great pleasure in making known the success of the Fall Show. We have not upon any previous occasion had such a display of stock and manufactures, nor yet so many improvements in the various departments.

There were in all 479 entries, being an increase over the past year of 107. The principle increase being in horses, cattle, sheep, domestic manufactures, agricultural implements and dairy products.

Your directors cannot pass over the exhibition without drawing attention to its principle features and good results. In order to show and compare these improvements, we would require to look into the records of past exhibitions, and to times when agriculture was at a very low ebb in this County.

The materials out of which this society was formed are very old. It was first formed at a time when no Legislative grant was received; its existence depended entirely upon the energy of its individual members; it was formed for mutual benefit. Their stocks and seeds had so much deteriorated by constant combinations and sowings, that they required to get something new to infuse fresh vigor; they procured fresh seeds, stock, and implements; they did not at this time award prizes, but upon the 20th day of January, 1831, a society was regularly organized, under the provisions of Legislature, passed in March, 1830. This wise enactment came very opportunely to the assistance of those pioneers of agricultural societies. The very

first step taken was to procure two imported Durham bulls for the special use of the members. It happened, fortunately for the society at this time, that an English gentleman of some capital settled in the County. He brought with him a number of very superior rams and ewes of the Leicester breed, these were perhaps among the first direct importations of sheep that came to the country, a few years showed the beneficial effects of them. Although not under the control of the society, yet several individual members of it, had very good stallions. By this time the society had its annual shows both spring and fall, besides its ploughing matches. The next step at improvement, was the purchasing of and presenting to the members, a copy of Hind's Science of Agriculture, the object being to throw some light upon the chemical nature of soils, so that improvements in culture should be gone into. It also offered high premiums to mechanics for improvement in and introduction of new and labor saving machines, and those have been continued by the society up to the present time. Thus has this society been going on step by step in improvement each successive year; suggesting something new, purchasing and distributing (at cost price) new and suitable varieties of fall and spring wheat, clover seed, gypsum, plaster, &c., until we have arrived at the state of progress which we enjoy.

The whole of these improvements, whether in our stock, mode of culture, domestic utensils, the economic arrangement of our barns, barn-yards and outbuildings, the proper management and application of manures, the housing and feeding of cattle, and even the luxuries of life which we enjoy, are all traceable back and through this society, which had its origin more than a quarter of a century ago.

We can now look back with feelings of pleasure upon those days, although they were not days of ease and enjoyment, but hard toil. Man did in those times, verily eat his bread by the sweat of his brow, for the old adage of "no work, no meat," would have soon been confirmed.

If we can look back and observe the amount of good done, under circumstances of hardship and difficulties, how much more then can now be accomplished when we have none of these things to contend against. We have now wealth, experience, time and talent,

at our disposal, are we properly applying these? We fear many are not, and against whom we hold up a finger of warning. We will make our remarks general, let those to whom they will apply think of them. We said we fear not, the too prosperous times which we have for some time enjoyed, the very high prices attainable for our produce, especially wheat, have blinded our eyes. We have been too well satisfied with past and present prosperity, without casting even a passing thought on future evils.

Wheat has for some time commanded a high price, higher in proportion than any other article of produce. The consequence has been for some years the whole attention has been turned to the raising of it. Wheat after wheat, wheat after wheat, every field is wheat; no rest for the soil, nor replenishing of the necessary productive ingredients. No, every spark of life which it possessed has been sucked out of it, until Nature has cried out, enough, by not yielding her usual bountiful supplies.

We agriculturists have received a check; an all-wise Providence has interposed His hand by sending a blight, a plague, cutting down our usual fair fields by blight, rust, and myriads of the midge fly; we are thereby compelled, whether willing or not, to yield our land that rest which under the present system pursued, it requires.

The question naturally arises, what is to be done to get rid of this evil?

We would say pursue a regular system of rotation of crops. Supply the land by manure and proper cultivation, with the nutriment which has been extracted from it, and trust to Providence for the rest. The system which we would recommend may in another part of this report be treated upon.

One of the greatest enemies which the farmer has to contend against is the rust. Volumes have been written upon this subject, without effecting a cure; hundreds more may be written with a like result. We have little faith in those all-cures of patent medicine vendors, dispensed under the pretence of remedies for the blight. We pretend to give a thorough cure for this without any quackery, and it is in the power of every individual to carry out our suggestions. They are the result of observation, and every farmer is as well acquainted as we are with the facts, and upon reflection, will bear us out

We say then, the effectual cure for *rust* is to *change your seed oftener*. We do not say that merely doing this from one farm to another in our own locality—although that should be done oftener—nor yet from one part of the Province to another—that also has its results—but we mean from one *climate to another*. That seeds will run out if constantly sown, has been verified, and therefore requires no discussion to prove it.

The facts which have come under our observation are these: Every farmer of twenty years standing we speak of this country, knows of the great blessing bestowed upon this Province by the introduction of the variety of wheat known as Siberian. Previous to its being introduced, a kind was used which was almost certain to be effected by the rust; many a field which looked bright and promising, would be, in one day, thoroughly blighted. This new variety was sown and stood the test; for several years rust was not known. The conclusion came to was that it was a variety which was not only prolific, but that the rust could not affect it. But bye and bye this also was injured, until at last it proved a complete failure. A new variety, *Black Sea*, was introduced, which had every prospect, like its predecessor, of withstanding the blight; but, like it, it failed. Yet another variety, *Club*, was introduced, which is passing through the same ordeal, and, in many localities, with like results. When this last variety was first introduced, 12 years ago, so white and plump was it that a wheat merchant bought some of it for fall wheat. We have now another variety, *Fife*. We have not heard until lately that this variety was affected, but yet it has been, though not to the same extent; for the two kinds, *Club* and *Fife*, have been sown in the same field, when the former would be rusted, and the other not. We have spoken only of the spring varieties, as they have been more marked; we might trace like results in the Fall. Now, what deductions do we draw from this? We have seen that all new varieties have for a time withstood the effects of rust; but afterwards become as much injured as their predecessors, and this has not been in consequence of the season being more favorable for the one than the other, nor yet the location of and difference in quality of soil, for they have been sown in the same field, and

at the same time. We say that if a new variety of wheat was introduced at least every five or six years, that Canada would not have to complain of the total failure of her crops, through the effects of rust. Another feature in connection with this, and which has been sparingly if at all tried, is *drainage*. This important matter cannot be too often brought before our eyes. There are few but will acknowledge its advantages; but they lack the courage to test it. All kinds of land require it more or less.

Your Directors are happy to say that through the kind interposition of Providence, an exceedingly bountiful harvest has been the reward of the farmer's labor. The crops this year have not been seriously attacked by the many diseases and blights to which they are occasionally subject. We know of very few instances where the midge has injured the crops this year, the consequence is, that we have more than an average. We must not think that we have got rid of this small but yet not despicable enemy because we do not see so much of his work this year; we believe the temperature of the season has been a great means of preventing his depredations.

We cannot too highly recommend to your notice the observations and remarks of that distinguished agriculturist, John Wade, Esq., whose opinions on the midge will be found in the September number of the *Agriculturist*, and as the season for spring wheat sowing will soon come round, we recommend them as containing important practical information. Your directors, in speaking of the fall show, would say a very pleasing feature in connection therewith, was the great number of animals and articles that had been at the Provincial Exhibitions. We here thank those energetic individuals for having this country so well represented; and we are also happy that the results were so favorable to themselves; first upon our list stand the class of horses, in which the names of Trull, Simpson, Arnot, and others, are well known as successful competitors.

Our cattle also stand very high, first from the stock of Mr. Wade, and latterly from various good herds. The Durham cattle of the Hon. John Simpson, Messrs. Joness and Bellwood, have upon several occasions taken the first and second prizes. Last year Mr. Joness, and this year Mr. Bellwood, have bought new and very superior Durham bulls.

In Devons, Mr. Davey, Mr. Richard Allen, and Mr. Courtice, stand high; the two latter gentlemen having lately imported some animals of this breed from England. Our improved or grade cows are very good, many of them, except in name, superior in point of size and feeding qualities to the pure breeds.

Our Sheep we need scarcely say anything about; they are well known. We speak confidently when we say that this County stands second to none for this class of animals, as the Provincial prize list can testify. In Agricultural Implements, we stand unrivalled. There is no county in the Province that enjoys the same advantages that we do in respect to implements. We not only have these at our own door, thereby yearly saving a great amount of freight and inconvenience, which we were formerly put to by getting them from the United States, but they are of the best kinds. Your Directors this year departed from the usual method of judging these machines. They were tested in the field, giving the prizes to those only which merited it by actual work, the results of which were highly satisfactory, and will prove highly beneficial.

Dairy products have this year been fully represented, both in quantity and quality.

In grain we are happy to say that this County has again carried off the Canada Company's prize for fall wheat at the Provincial Exhibition, and also one prize for spring wheat.

FURTS—In this class we had a great display, some of which was of very superior kinds, there were two first prizes awarded.

Before drawing this, perhaps too lengthened report to a close, it has been thought expedient, at the request of the Provincial Association, for the benefit of those who may not be acquainted with this important locality, that a little should be said upon the general features of it, with the improvements made.

The Electoral Division of the West Riding of Durham is composed of three Townships, forming two sides of a square covering an area of 310 miles, and having an aggregate of 193,200 acres; when the census was taken in 1842 its population was 7,707, and lands cultivated, 50,268 acres; it now has a population of 25,000, and lands cultivated, 123,000 acres; the assessed value, according to equalized revised assessment of last year, \$4,050,000; the actual returns, however, being \$82,931 above that.

The Township of Darlington and Clarke,

form the front, bordering upon Lake Ontario with the Township of Cartwright in the rear of Darlington. The geographical position and the salubrity of the climate and richness of soil have long pointed this County out as desirable situation for settlement. It is exceedingly easy of access either by water, railroad or internal communication by gravel roads.

The physical features of the country are not marked by any peculiarity; it rolls a little from east to west, but from south to north rises gradually for a distance of twelve miles to a pine ridge, and then gradually dips to the north.

There are many large living streams of water, but none of them of sufficient size to be called a river; upon these are to be found many superior flouring and saw mills. The only large sheet of water is that of Scugog Lake, situated in the Township of Cartwright. Although it is called, and has every characteristic of a lake, yet it is really only a mill-dar for the Town of Lindsay. It covers nearly 20,000 acres, (and we would here warn anyone against buying land in this township beyond the seventh concession, unless from personal inspection, for after purchase he may find it covered with water, as we have known such cases), it is navigable, a small steamer running upon it which is employed in carrying lumber, and taking excursion parties to the back lakes. There is an island in the center of it, a portion of which belongs to a tribe of Indians, who employ their time in hunting and fishing, being too lazy to cultivate their lands.

SOIL—The general character of the soil in each of the townships varies, although upon the whole it may be classed as nearly the same. There are in each the stiff clay, the rich alluvial, and the light sandy; but in each one kind predominates over the other: in Darlington, clay; Clarke, loamy; and Cartwright, light sandy soil.

For agricultural purposes this county is not surpassed. All kinds of grain can be raised, but particular attention is turned to the raising of fall wheat; in this, perhaps, upon the whole it stands preeminent. The far-famed Genesee Valley of New York State cannot equal it in point of quantity or quality. The greater portion of our wheat finds its way to the United States side of Lake Ontario, out of which they manufacture their best brands of flour; the consequence is that they receive the character of raising good wheat, while at

same time they receive their supplies from Canada. This will be the case until we have better facilities for manufacturing.

The varieties of fall wheat principally sown the Soule's; there is no kind that we are aware of that suits as well as this. It is uniform in color, yields well, and commands the highest price for manufacturing. The average yield of this year is twenty-five bushels per acre. Were we to take in a certain range, of the whole of the front and ten miles back, the average yield would be not less than thirty bushels, many fields ranging as high as forty-five bushels, while a common yield has been twenty bushels. Spring wheat would give rather the best yield, say an average of about thirty bushels. The kinds sown are Club and Blue; the quantity sown to the acre is generally two bushels.

PEAS have been a good crop and free from diseases, the yield would be thirty bushels; the quantity sown from two to three bushels per acre, according to variety. The best kinds are marrow fat and golden vine; a new variety white with black eye—commands the highest price in England. We would advise all those who can procure the seed, to sow them, they yield well.

OATS—A good crop; average forty bushels; several varieties, black Tartar and white potato; about three bushels to the acre.

BARLEY—The high prices last year, with the uncertainty of the wheat crop, induced many to sow; there has upon this account the price more raised than usual, the average yield would be twenty-five bushels.

RYE and CORN—Very little grown.

OF TURNIPS, CARROTS, and MANGEL WURZEL there has been a larger than usual quantity sown this year. They have latterly been the object of the increase. Farmers are beginning to take the propriety of raising these roots for the benefit of their stock, many of our best having now seven to ten acres. For milk cows, mangel wurzel is preferable; it imparts a richness to the milk not to be found in the others. The average yield of root crops would be 700 bushels per acre; the varieties now in use are, Laing's and Skirving's improved purple top and yellow bottom Swede; long orange carrot, and long red mangel wurzel.

POTATOS were a very good crop, notwithstanding some having been cut down with the late frost in the spring, and again nipped early in the fall; the average yield would be 100

bushels. The best varieties are clips, and farmer's delights; the latter yield well.

CLOVER and timothy hay a very good crop, but rather below the average, the season being very dry; the average $1\frac{1}{2}$ tons.

Fruit is now very plentiful; very few farms but what have several acres of orchard bearing fruit. Formerly we had our supply of young trees from the States, but now we have four nurseries in the county. J. P. Lovekin carries on an extensive business in this way, supplying many counties throughout the Province. Apples are the principal fruit, but Pears, Plums, Cherries and occasionally Peaches and even Grapes are raised in the open air. Of late the plums have been destroyed by a blight which has come upon the trees.

From the average of crops we now turn to the value of land. The two front townships, —Darlington and Clarke—to the depth of the sixth concession, may be valued at sixty dollars per acre, and from that to the rear of the township at thirty; that of Cartwright about twenty dollars. These averages are laid down upon actual sales, with all the necessary improvements of fencing and buildings. There are many farms however, that could not be bought even at \$200 per acre, but we do not presume to call these the value for agricultural purposes, nor do we include them in the average; but farms of one hundred acres in good localities can be had at our outside average figure.

The mode of cropping here is varied, every one apparently following out the bent of his own inclination. That of our most successful farmers, and whose example after a time will be copied, is, fall wheat upon naked fallow, oats, green crops, (including peas, as such), spring wheat seeded down; sometimes one and sometimes two crops of hay, according to circumstances; if one crop is taken, then two years' pasture, and if two years' hay then one year pasture. Where spring wheat only is sown the rotation is as follows: Peas after green sward, oats, green crops, wheat seeded down, with hay and pasture as in the fall wheat system.

WAGES—The rate of wages for farm servants by the year is from \$130 to \$160; other hands are only employed during hay and wheat harvest, in the former getting \$1, and the latter \$1.25 per day, and if for draining or other work, not at these times, 75c., all with

board. Mechanics generally, unless by the job, work by the day, and get from \$1 to \$1.25, according to the nature of the work; they boarding themselves at these rates; but if hired by the month, \$16 is the usual rate, with board.

MANUFACTURES—As before stated, few counties are better situated than this for manufactures, more particularly agricultural implements. If we want the axe to chop, the plough, either double or single board, Scotch or Canadian, iron or wood on subsoil or surface, we have them; the harrows or drags, iron or wood, the cultivator, horse rake, mowing and reaping machines, threshing machines, &c. The establishment of Mr. Massey, of Newcastle stands very high. He turns out annually over \$20,000 worth in machines of various kinds; perhaps his latest improvement upon his combined mower and reaper is not equalled. At a recent trial of mowing in clover, its cut being 60 inches, its draft was an average of 325 lbs. These can be had for \$120. Of woollen factories we have but two, and they of a local nature, carding and weaving for domestic use; a good deal of home made woollen goods being still used.

FLOUR—There are twenty-two mills for flaring, better than half of these are for merchant work only, the rest for custom, and export. There are several of these which stand very high, two particularly noted, the Bowmanville and Newcastle; the former took a medal at the Exposition in London 1851; the latter upon several occasions, has taken the first prize at the Provincial Exhibitions. The exports for 1858 were valued at \$300,000 and were chiefly composed of wheat, flour and lumber.

CATTLE—The cattle of this county have improved very much. Native are now scarcely known; the principal kinds are pure bred Durhams and Devons, and others improved from these. A few years ago there were none fattened for export, but latterly attention has been turned more to that branch of industry. To follow it out properly, it must prove a source of profit. At present the demand is good, and very good prices obtained. We have seen several hundred head of cattle taken from this county this year, and where they have been bought by weight, \$6 per 100 lbs. was the common price, but when in good condition \$7 was paid. We think the Durhams are the best for feeding purposes; these and Devons

are the only kinds we have in the county, and therefore cannot state their relative qualities against others such as Galloways, Ayrshires, &c. The profit of feeding may be illustrated in one example. A cross Durham cow, giving milk part of the summer, was put up in fall, fed, and sold, within three months. She was fed three bushels of turnips per day, without any hay, and during the whole time she got in small quantities two and a-half bushels peas; thus she ate say 260 bushels turnips and 2½ bushels peas, the price realized was \$57, or according to weight, \$7 per hundred pounds.

SHEEP—In these we are not surpassed, there are a number of sheep breeders here, who have from time to time imported fresh blood to keep up their stocks; the principal kinds are the Leicester, Southdown, and Cheviot. We think the most profitable kinds would be a cross between the Leicester and Cheviot. In these will be found weight of carcass, fineness of wool, and quality of mutton. We think that if more attention were paid to sheep raising, they would pay better than any other kinds of live stock. There is little trouble with them, while at the same time they yield a good return.

WOOL—In this article of commerce there is much neglect. We know that thousands of dollars are lost annually by not paying proper attention in securing it. From the improper and dirty manner in which it is brought to market, it does not bring within six-pence per pound of its real value. Farmers may not will not believe this, but we speak from experience in the matter, having been in the wool trade more or less for the past 16 years.

The quality of our wool, as a whole, is much finer than that of England; but little, if any, ever gets to that country. It is generally bought for the American market. The buyers from that quarter put a regular price upon Canadian wool, not according to quality, but all at one price, the only distinction being washed and unwashed. The agents employed get a certain per centage per pound, therefore in purchasing they make no distinction in quality; the per centage to them on a pound of dirt is equal to a pound of wool, therefore, a premium held out for bringing it in without bestowing the least care upon it, but all this tends to depreciate the sample. There are very few that have got sufficiently large flocks to make this a subject of enquiry. Large lots always bring a higher price than

small ones, because there is much less trouble with them.

We presume to offer a suggestion, which if carried out will prove remunerative. Farmers of a township should club together, employ a person who understands the packing and assorting the qualities. All the fleeces should be separated according to their fineness, and other general qualities, having each lot as uniform in color as possible, and then properly packed. This must be carefully done, for when taken to market a certain number of bags out of each lot are ripped open, and these constitute the sample for the rest of the lot; for an inferior fleece is put in, it will be just so much off the price of the lot. Uniformity then is a great point, and that depends much upon the farmer in washing and shearing it. It is of the greatest importance to have the fleeces well washed, so that the wool may be as bright in color as possible. It should at all times be washed on the back of the sheep. After they are washed, they should be at once driven into the pasture field, or in some clean place, so that the wool may not get mixed with chaff, burs or leaves. The tags must be carefully taken off, and when the fleece is rolled up, part of it should not be twisted into rope to tie it, for that is the means of matting together: it should be rolled up carefully and tied with a cord. Wool put up in this way, employing a proper person, will bring from 50 to 60 cents, while under the process generally used 25 to 30 cents is the price. We give this to the consideration of farmers, let them at any of their meetings discuss this and kindred subjects; they will find it to their advantage to do so, and we would here advise, at upon these occasions, the mechanic and merchant be not excluded from taking part in their discussions; these two classes of individuals, from their position and intercourse of business, can at many times impart very valuable information to the agriculturist. Were we to press home our remarks upon one particular more than another, it would be upon that of meeting more frequently and discussing subjects. Few but those who have had opportunities of attending, know the value of it. Farmers' clubs and associations should be started in every township in the Province—subjects touching upon improvements should be treated upon. How few farmers there are who bring the least particle of science to bear upon their vocation. They scout at the idea of book farming and the remarks of men of

science. They turn their back upon you when you speak of the chemical analysis of the soil, and its various properties, but these old prejudices are now fast giving way.

In drawing our remarks to a conclusion, we cannot do so without referring more particularly to the means employed in bringing our Province into notice; and we have much pleasure in saying this has been accomplished through the aid of our Agricultural Societies, ably seconded by the support of Government. All civilized governments are aware that agriculture is quite indispensable to national prosperity. Hence, the degree of interest manifested in it by our Government. As before mentioned, as early as 1850 an Act was passed for the establishment and encouragement of Agricultural Societies, and as boundaries extended, and circumstances required, new enactments have been passed for the fostering of the same, which has been the means of stirring up a spirit of emulation for improvement in many a locality.

It would be impossible for us to enumerate the benefits resulting from our Provincial Agricultural association; these are incalculable. The first step taken in its formation was a bold one and worthy of its projectors; it has now been in operation 14 years, and all must acknowledge that through its agency this country has been elevated to the high position which she now holds as an agricultural one. Through its means, reports and essays have been written showing the resources of the province. High premiums have been offered for the most improved labor saving machines and implements; encouragement has been given for the importation of cattle and seeds, till now we stand second to none. May these improvements continue, each year shewing a progressive movement in the agriculture of our country.

TOWNSHIP BRANCHES.

CLARKE.—Seventy members; amount of subscription, \$121; balance from previous years, \$33; share of public grant, \$80; total receipts, \$234. Paid for copies of Agriculturist for members, \$34; premiums, \$51.25; paid County Treasurer, \$121; expenses, \$12.25; balance in Treasurer's hands, \$15.50. Liabilities for prizes, &c., \$26; assets, amount in County Treasurer's hands, \$184.

Extract from Report.

Your Directors would call particular at-

tention to the Fall Wheat Seed Show. There is no work of our Society that flourishes better, or is more deserving of our countenance than this. We may toil ourselves to death in order to prepare the ground, but unless we are particular in the selection of seed, all our efforts will be utterly or nearly useless. Our Seed Show has now been in operation for five years, and during that time it has been steadily gaining in importance. Owing to the failure of the crops in some parts of our own and neighboring townships, hundreds of bushels have this year exchanged hands. As you are aware, one of the rules of the Society is, for all exhibitors to furnish a written statement of the manner of tillage. This we consider a very important point, for by this plan we can compare the different systems pursued, then observe the results. The intention of course is to make these known. Out of the various lots the same system seems to have been pursued except in one instance: all the crops have been on summer fallow except this one, which was on Pea fallow. Eight lots, of an average of $16\frac{1}{2}$ acres, each produced on an average $30\frac{1}{2}$ bushels to the acre, the highest being 40 bushels, while the lowest was 16 bushels (upon light sandy soil). The Pea fallow, $11\frac{1}{2}$ acres, 29 bushels to the acre.

The crops in this township this year may be safely counted over an average, few, if any of them, have been affected by the weevil; the rust has done some damage but not to the extent of last year; in the Spring there was much alarm felt about the grasshopper which had done so much damage last year, many prophesying that this year every green thing would be destroyed, the fence corners and stump roots were eagerly hunted for them, some reported having found bushels; but notwithstanding these prognostications and alarms, no harm was done.

The Township of Clarke is the eastern one of the west riding of the county of Durham, and covers an area of 72,000 acres; it is 45 miles to the east of Toronto and borders upon Lake Ontario; it has been partially settled upon the front from forty to fifty years, but it is only within the last twenty that settlement has become pretty general, and the last twelve have shewn great improvements. It is very easy of access, having two harbors and two railroad stations, Newcastle and Newton, at five miles distance from each other.

For internal communication it has two good gravel roads, one running east and west, and one running south and north. It is well watered by first-rate living streams, upon which are many flouring and saw mills. Its export trade is very considerable. Taking the average returns for the past four years the exports are, per year, \$130,518, principally in Wheat and Flour. The assessed value of the township, according to revised assessment, was \$1,374,179.

Crops.—The average crops of Fall and Spring Wheat are this year nearly the same, we may state the average at 25 bushels per acre; many farms have as high as 40 bushels, while others may be as low as 15 bushels, but the crops have been very good. We can confidently say there is no township in the province that can surpass this for the raising of Fall Wheat; the land is peculiarly adapted for it; in 1855 one farmer, Mr. B. Bowen, had a return of 60 bushels per acre of Fall Wheat. We confidently believe that if farming were carried out to the extent of improvement as that of England and Scotland, that the yield of this country would be greater than either of the others."

[The Report here contains some interesting information in regard to the agricultural productions of the township, but which, being to a considerable extent a repetition of that given in the report of the county, is omitted. The report concludes:]

"Were we to speak of improvements made, we would say they have been very rapid. Unless in the very rear of the township, a log house is not known; they have all given way to large and commodious brick, frame, and stone. Farmers are now very well off, and after their toils of former times, they are now, at the decline of their days, inclined to take their rest, with every appearance of comfort. Twenty years ago there were few if any horses in the township; a yoke of oxen and an ox-cart, with some clean straw in the bottom of it for the benefit of the fair sex, was the only conveyance known. Now splendid covered carriages, horses with shining coats, with silver mounted harness, are the fashion. Thirty years ago many had to go 20 miles to get their grists ground, and now they have mills at their own doors; fifteen years ago you could get cash for nothing but wheat, and if the old lady had the misfortune to have a headache and wanted a little tea you had to

two bushels of your best wheat to pay it, but now cash can be had for anything the farmer raises. He can now get for a bushel of wheat two or three pounds of , and of a better kind too. We can readily calculate the changes that have taken place: fifteen years ago we had not a windmill worthy of the name, we have now twenty. The same length of time ago, we had the misfortune to break our plough at, we had to trudge off 15 miles to get a new one, and sometimes were considered particularly fortunate if we had not our journey for nothing: but now we have two extensive iron manufacturing manufactories; fifteen years ago there was scarcely the chance of getting a common school education; now we can get a good education in our common schools, and if our sons or daughters wish to get a step higher they have the advantages of a Grammar school, or some private Academy where all the required accomplishments may be had.

ARLINGTON.—One hundred and thirty-five members; subscription, \$150; share of the grant, \$176; receipts at show, \$84; received, \$410. Paid balance due Treasurer from previous year, \$85 55; paid for *Agriculturist*, \$54; paid in premiums at spring and fall shows, \$233.75; expenses, \$21; balance in treasurer's hands, \$6.46.

ELGIN.

COUNTY SOCIETY.—Fifty-five members amount of subscription, \$55; balance on hand from previous year, \$667.63; received from presidents of two township societies, \$20; raised by township societies, \$483; legislative grant, \$599.96; total receipts, \$1824.64. Paid township societies, \$843; premiums, \$375; legal expenses, \$50; other general expenses, \$87.75; balance remaining in treasurer's hands, \$645.14. In 1860, this County, which had heretofore contained but one County Society, organized a Society for each Electoral Division, East and West Elgin, under the Act, 20 Vic. c. 32.

Extract from Report.

The County of Elgin comprises seven townships, or some 450,000 acres; and is increasing in wealth and population, and in the development of agricultural skill; which is in a great measure attributable to the natural fertility and capabilities of the soil, partly to the impetus and encouragement

given to all agricultural pursuits for the past three or four years, by this parent Agricultural Society and its several branches throughout the different Townships.

The great disparity heretofore existing between the price of manual labour and agricultural produce has been a great drawback to all farming operations and improvements; but the introduction, lately, of reaping and mowing machines, and in fact, of all the improved manual labour-saving machines of the present age, on a large scale in this section of the country, has so reduced farm labourers and mechanics' wages, as to render farming an agreeable and profitable undertaking now-a-days; and improved farms have consequently increased much in value. Some two years ago, when a good farm hand would during harvest time command from one dollar and a half to two dollars per diem, a 200 acre lot with house, barn, and driving sheds, and say 80 acres of clearance, could have been purchased in a good locality, convenient to markets, in this County, for about \$28 per acre; whereas now, when farm hands can be hired for one-half the amount, the same farm would bring at least \$40 per acre.

The soil is principally a rich loam, resting upon a heavy retentive stratum or subsoil, with here and there streaks or ridges of stiff clay. The surface is uneven or rolling, and consequently dry, but in some localities requires draining, and with moderate care and cultivation, all manner of root and grain crops grow luxuriantly. Wheat is, however, the staple crop, and some thousands of bushels are annually exported, but last year this crop suffered much both from the ravages of the midge and spring frost, say twenty-five per cent from the former cause, and at least thirty-five per cent from the latter, so that more than one half of the crop was destroyed in this way. The breadth sown with Wheat this year is very small in comparison with that of former years, and much of the land prepared will be sown with Spring Wheat.

Owing to the natural fertility of the soil, and an over-abundance of it, very few of our farmers as yet study the philosophy of tillage, or see the necessity of pursuing a regular system or rotation of crops, but exhaust the land by taking the same kind of crop year after year out of the same piece, and that too without supplying any kind of manure in return, while at the same time the barn yard

may be knee deep with muck of three or four years standing, which for want of removal is rotting away the sills of the surrounding buildings.

The present system of barn-yard management cannot be too strongly deprecated: our farmers generally locate their barns and out-buildings on a rising ground, so that the yards may be dry and the nasty washings run off, perhaps into the road or stream; by this much the greater part of the liquid excrements is lost, and, by suffering injurious fermentation, a large quantity of the organic gases escape, and the soluble and consequently most valuable portion of the manure is washed away by drenching rains. These evils every one familiar with farm management must have observed. The direct loss to the individual by such a reprehensible practice is great, while the indirect loss to the community is inestimable.

No farming can be profitable when the manure is thus shamefully wasted, and nothing is plainer than that the crops of the farm and the profits of the farmer are in direct proportion to the amount and value of the manure made on the farm. The great aim of the farmer in the management of barn yard manure should be, first, to preserve all the liquid; second, to keep up a slow fermentation, never letting the heap heat or ferment violently and thus throw off its ammonia; third, to prevent leaching during heavy rains and melting snows. Were these three conditions properly attended to, the value of the manure on most farms would be at least doubled.

There was a very visible improvement in the different breeds of horses, cattle, sheep, and hogs, exhibited at the several Township Agricultural Shows in this county during the past year, both as regards quantity and quality; and we find that the generality of our farmers are giving their particular attention to raising stock, and surely no country in the world is better adapted to the raising of cattle and sheep than this, where land is not only cheap and plentiful but of unequalled fertility, yielding rich natural grasses in great abundance.

This undoubted fertility of the soil for grazing purposes, the fine dry climate, the cheapness of land and the high price of labor all point to stock raising and wool growing as the most profitable department of farm economy in this Province. Therefore the improved breeds of cattle and sheep can be

profitably introduced into this county, and it is gratifying to observe that some few of our enterprising fellow-farmers are making praiseworthy efforts to improve their breeds of cattle by importations from the United States and Europe.

The introduction of improved breeds of cattle has already added thousands of dollars to the wealth of this County; and though much has been done in this direction, there is still abundant room for future improvement. The great majority of cattle sent to market in this section of the country, though of a very inferior order, might be very profitably crossed with a Durham or Devon Bull. It is doubtless important to have both parents good, but in the case of ruminants the predominating influence of the male in determining the qualities of the progeny is so well ascertained, that the selection of the bull is a matter of prime importance. Judging from the number of well-bred bulls exhibited at our County Spring Show of last year, we should say that our farmers are not aware of this, and at last waking up to the fact that it is quite as easy to breed good animals as poor ones; and that the cost of labor for the one is no more than for the other, while the difference in the nett profit is amazing.

The Durhams and Devons have each their respective advocates here, but it is generally contended by all that the Durhams are the best breed for rapid feeding and early maturity, being perfect at three years old; and a cross between a Short Horn or Devon and a native cow is considered the most valuable for dairy purposes.

Much attention has of late years been bestowed on raising sheep and wool, and improvement in the various breeds is quite apparent to all; flocks of pure Leicester, South Downs and Merinos are to be met with in all quarters, while the long-legged, shag-wooled, ill shaped Canadian sheep (like the Aborigines of the country) are fast disappearing and giving place to the now favored breeds. A cross between the Leicester and South Down is becoming a general favorite here, and appears to be a hardier sheep, producing more wool and mutton than either its progenitors. The climate and soil are admirably adapted to sheep raising, and although large numbers are annually exported to satisfy the increased demand of the United States

kets, yet the stock on hand suffers no diminution, but on the contrary, is rapidly increasing, and the wool crop of this county last year was more than double that of any former year.

The management of Hogs is shamefully neglected, both as regards breeding and feeding, and the present system of raising pork is rather a losing game. Hogs are in most instances allowed to wander at large in search of food the whole year round, until shut up the pen to fat. Now the same rule applies feeding and raising hogs to advantage as to cattle, viz: It is just as easy to raise good as bad ones, and the food for the one is no more than for the other; but who can estimate the difference in the profit? It is encouraging, however, to know that there are some enterprising men in our midst who are endeavoring to understand the economy of raising pork, and who have, at considerable trouble and expense, introduced both well-bred Berkshire and Yorkshire hogs to this portion of the province, so that any farmer at anxious to improve his breed of hogs can now do so at a very trifling cost; and we are long to see a great change in this department of the farm management.

Miscellaneous.

SAGACITY OF A DOG.—From an English Journal published several years ago we cut the following remarkable instance of the sagacity of a dog, and although some of our readers may have read it before, it is well worth re-publishing: About eight months ago, a gentleman belonging to this city embarked at Port Philip for England. In the bustle and confusion of preparing for so long a voyage, a favorite dog disappeared about a couple of days before the vessel in which he returned left Port Philip; and as all the inquiry he was able to make turned out to be fruitless, he was under the necessity of leaving his four-footed friend behind. He arrived in Edinburgh about two months ago, and wonderful to tell, within the next three weeks was surprised by a visit from the animal he had left in Port Philip about the same time before. Upon inquiry it turns out that the dog had gone on board of a ship on the coast of sailing for London; that once aboard, he had absolutely refused to be put ashore, and by dint of his persevering resolution obtained a passage. On his arrival in London, it is ascertained that he visited the lodgings formerly occupied by his master, and, failing in discovering the object of his search, immediately disappeared, and was not

again heard of until his arrival in Edinburgh. Familiar as we are with instances of the affection and sagacity of the dog, this is perhaps the most extraordinary example on record. His going on board an English ship many thousand miles from home—his refusal to quit it—his visit to the former lodgings of his master on his arrival in London—and the journey from London to Edinburgh—rank the subject of this brief notice as one of the most wonderful animals of his species. The gentleman to whom he belongs is well known in Edinburgh, and is the son of a gentleman who, within the last twenty years, has filled various offices of civic dignity.

THE LESSON OF THE LEAF.—We men, sometimes, in what we presume to be humility, compare ourselves with leaves; but we have as yet no right to do so. The leaves may well scorn the comparison. We who live for ourselves, and neither know how to use nor keep the work of past time, may humbly learn—as from the ant, the foresight—from the leaf, reverence. The power of every great people, as of every living tree, depends on its not effacing, but conforming and concluding, the labors of its ancestors. Looking back to the history of nations, we may date the beginning of their decline from the moment when they ceased to be reverent in heart and accumulative in hand and brain; from the moment when the redundant fruit of age hid in them the hollowness of heart, whence the simplicities of custom and sinews of tradition had withered away. Had men but guarded the righteous laws and protected the precious works of their fathers with half the industry they have given to change and to ravage, they would not now have been seeking vainly, in millennial visions and mechanic servitudes, the accomplishment of the promise made to them so long ago: "As the days of a tree are the days of my people, and mine elect shall long enjoy the work of their hands; they shall not labor in vain, nor bring forth for trouble; for they are the seed of the blessed of the Lord, and their offspring with them." This lesson we have to take from the leaf's life. One more we may receive from its death. If ever, in autumn, a pensiveness falls upon us as the leaves drift by in their fading may we not wisely look up in hope to their mighty monuments? Behold how fair, how far prolonged, in arch and aisle, the avenues of the valleys—the fringes of the hills! So stately—so eternal; the joy of man, the comfort of all living creatures, the glory of the earth—they are but the monuments of those poor leaves that sit faintly past us to die. Let them not pass without our understanding their last counsel and example: that we also, careless of monument by the grave, may build it in the world—monument by which men may be taught to remember, not where we died, but where we lived.—*Ruskin's Modern Painters.*

THE BRITANNY COW -- A correspondent of the N. Y. Tribune, writing from Philadelphia under date of Dec 4th, says: "An importation of a great agricultural wonder will be made here by one of our wealthy fancy farmers, in the spring. It is the Brittany cow, from France, a mere miniature creature, barely three feet high, docile as a cat, giving eight to ten quarts of rich milk daily, and consuming almost as little food as a goat. This breed has recently been introduced into England, where it has excited the utmost wonder and admiration even from experienced breeders. As described to me, every citizen who boasts a garden of moderate size will be able to be his own milkman by simply tethering a Brittany cow on his grass plot.

The Agriculturist for 1861.

The *Agriculturist* is published semi-monthly, each number consisting of 32 pages, and forming a volume of 768 pages.

The *Agriculturist* is exclusively devoted to Agriculture, Horticulture, and similar subjects. It is the cheapest paper of the kind in North America, and specially adapted to the circumstances of the soil and climate of Canada.

The *Agriculturist* is Post Free.

The terms of subscription are: Half a dollar per annum for single copies; Eleven copies for Five Dollars; Twenty-two copies for Ten Dollars; Thirty-three copies for Fifteen Dollars, &c. Payment always in advance.

CASH PREMIUMS.

As a further reduction in price on the largest orders, the following money premiums will be paid on copies ordered and paid for prior to or on 1st April next, viz:—

To the officer of any Agricultural Society, member of a club, or other person who shall send in the largest list of subscribers, accompanied with the cash, on or before the 1st April next, a money prize will be paid of.	\$20
To the person sending the next largest list, a prize of.....	19
The next largest.....	18
The next largest.....	17
The next largest.....	16
The next largest.....	15
The next largest.....	14
The next largest.....	13
The next largest.....	12
The next largest.....	11
The next largest.....	10
The next largest.....	9
The next largest.....	8
The next largest.....	7
The next largest.....	6
The next largest.....	5
The next largest.....	4
The next largest.....	3
The next largest.....	2
The next largest.....	1

Contents of this Number.

Feeding Stock, as a branch of farm management	3
Profit of Feeding.....	3
American Farmer's Visit to Canada.....	3
Sheep in connection with wheat growing.....	3
Land Drainage.....	3
Canadian Flax.....	4
Farm Implements and Machinery.....	4
Drilling vs. Broad-cast Sowing.....	4
Physical Geology of Western Canada.....	4

AGRICULTURAL INTELLIGENCE:

How Carrots affect Horses.....	
Salting Wheat in the Mow.....	
How to save Manure in Winter.....	
Pure bred Arab Horse in the United States	
Southdown Sheep.....	
Agricultural Instruction in Belgium.....	

HORTICULTURAL:

Meeting of Fruit Growers' Society of Western New York.....	
--	--

VETERINARY:

Relation of Veterinary to Social Science..	
--	--

TRANSACTIONS:

Abstract of Societies' Reports.....	
Durham East.....	
Durham West.....	
Elgin.....	

The Agriculturist,

OR JOURNAL AND TRANSACTIONS OF THE BOARD OF AGRICULTURE OF UPPER CANADA,

IS published in Toronto on the 1st and 16th each month.

Subscription—Half a dollar per annum single copies; Eleven copies for Five Dollars; Twenty-two copies for Ten Dollars, &c.

Editors—Professor Buckland, of University College, Toronto, and Hugh C. Thomson, Secretary of the Board of Agriculture, Toronto, whom all orders and remittances are to be dressed.

Printed at the "Guardian" Steam Press, King St. East, Toronto.