

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.

- Coloured covers/
Couverture de couleur
- Covers damaged/
Couverture endommagée
- Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée
- Cover title missing/
Le titre de couverture manque
- Coloured maps/
Cartes géographiques en couleur
- Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleu ou noir)
- Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur
- Bound with other material/
Relié avec d'autres documents
- 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
- 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.
- Additional comments:/
Commentaires supplémentaires:

- Coloured pages/
Pages de couleur
- Pages damaged/
Pages endommagées
- Pages restored and/or laminated/
Pages restaurées et/ou pelliculées
- Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées
- Pages detached/
Pages détachées
- Showthrough/
Transparence
- Quality of print varies/
Qualité inégale de l'impression
- Includes supplementary material/
Comprend du matériel supplémentaire
- Only edition available/
Seule édition disponible
- 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.

Pagination is as follows : [97] - 128 p.

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 type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
12X	16X	20X	24X	28X	32X

THE
CANADIAN AGRICULTURIST,

AND JOURNAL OF TRANSACTIONS

OF THE

BOARD OF AGRICULTURE, AGRICULTURAL ASSOCIATION, &c.

VOL. VI.

TORONTO, APRIL, 1854.

No. 4.

Reports, Discussions, &c.

TOWNSHIP OF HAMILTON FARMERS' CLUB.

At the meeting of the Township of Hamilton Farmers' Club held at Dixon's Inn, Court House, on Saturday January 28th, 1854. Alexander Alcorn, Esq., President, in the Chair.

Present—Messrs. M. Eagleson, Richardson, G. Black, Wade, Haywood, Taylor, Masson, Bourn, Bennett, Wright, J. Underwood, G. Underwood, Phillips, D. Black, Forsyth, A. J. Burnham, Sutherland, Dixon, &c., &c., &c.

The minutes of last meeting were read and approved, and Mr. George Black introduced the subject for discussion, viz., Draining, as follows:—

As stagnant water chills that genial warmth necessary to vegetation, all lands will pay for draining to such a degree that not only the surface but the whole of the staple or vegetable mould will be preserved in a sufficiently dry, healthy and friable state. Lands which are the chief objects of these improvements will seldom be brought to that state of perfection of which they are capable without the aid of covered drains held pervious by some substantial material, as stones or tiles, mere surface draining being at best an unprofitable substitute, because it does not draw the superabundant moisture from the roots of plants, and secondly, it occupies too much surface. When the mischief arises from water being partially obstructed, or from springs, there is no remedy but detaching these by digging wells, or boring with the augur, or adopting some method of discharging them which will immediately leave the land dry.

In considering what is called deep draining, which is the only method or rather principle of training established on long experience, I shall endeavor to draw your attention to the following

facts. In order to conduct draining of this description to advantage, it is highly necessary to have a knowledge of the strata of the earth, and of the streams of water which slide between them from what are termed well springs. But I confess I have not that knowledge of geology which would enable me to point out clearly the many different positions of the strata, a knowledge of which is highly important in the operations of draining.— However, it is easy to conceive that the best method of preventing the well springs at the bottom of hills from keeping the land too moist is by cutting a deep horizontal drain on the side of the hill to intercept the water and carry it away, thus preventing its overflowing the level land on the plain beneath, then, with a level if necessary, find the lowest descent for an outlet, also the most proper course by which to discharge the water from the adjoining lands, commence at the lowest point, for instance a road, ditch, valley, or creek, cut the main leader perhaps up a fence side, when it may remain open until the foot of the hill is reached, when the plain which is too moist commences, then before cutting is carried farther it may save labor to tap with the augur between the wet and dry a little above where the oozings commence, to find the depth of springs, (that is to find the thickness of the upper stratum of the soil,) if these be only four or five feet then commence cutting the drain horizontally along the bottom of the hill to intercept the water, if the plain or field be conical or circular the water will run both ways, then an additional outlet must be made at the other side of the field, or it may happen that the field is lower in the centre than at either side, such being the case one leader up the centre will suffice. As the strata between which the water descends which forms these springs have generally the same inclination as the surface of the hill, or nearly so, it follows that the drain should be cut perpendicularly to the surface of the hill, as by that means the second stratum will sooner be reached. But if in cutting to the depth before mentioned you find the upper stratum is not cut through, and in consequence no water oozes into the bottom of the drain, it is then proper to bore with a five inch augur say three

or four feet deeper, until water rises into the bottom of the drain,—where these succeed many holes should be bored.

Another plan I have adopted is sinking holes in the bottom of the drains, (the drain being as narrow as a man can work in,) fill these up to the surface of the bottom of the drain with small stones. Both these plans are a great saving of labor, for when you cut through the porous beds where the springs are always found, these holes will draw the water from a great distance. This mode of draining will give a depth of from six to eight feet below the surface of the plain and thus the water will flow away rather than rise from the lower springs or apertures of the stratum through the incumbent soil to the surface of the plain which is so many feet higher, to secure this is the great secret of draining these grounds, when the springs cannot be cut into simply by a common drain. I have known water in such situations to follow the augur to the surface and run in a stream ever after, and when dammed supplied power for a threshing machine. Still I am aware that this one drain, deep although it be, is not of itself sufficient to dry a field properly if the field or plain has a great declivity. There may be other situations at a lower depth which run out on the surface at a lower level, perhaps half way down the field, or perhaps more, if so these oozings must be interrupted the same as before shown, but it is likely the drain will not be required to be more than half as deep as the former. As to the filling materials, nothing can be more obvious than that the preference should be given to the most substantial and lasting. I have used a variety of materials—such as stone-built rubble, gravel, tiles, whins, thorn brush, &c., and many other materials which would take too much space to particularize in this paper. Such drainage as I have been describing should be filled with stone or tiles, I may mention that I do not think stone is so safe a material to fill with in this country as they are in Britain, owing to the frost penetrating so much deeper here, opening the soil over a drain so much more, thereby increasing the danger of the water washing the soil into the drain from the surface and closing it up, especially if the drain has not a great descent with a large conduit. I have observed many instances of such cases with stone drains in Britain, and timber-filled drains in Canada. However, where stones are convenient they will answer the purpose, and they may with care be used in deep drainage with advantage. In this case it would only remain to decide whether the handling of stones would not cost more than pipes. In constructing such drains the conduit should be from four to six inches square, but of course depending on the quantity of water to be conveyed. In constructing these drains the stones should be placed in a row on each side of the drain at the bottom and a flat stone laid across the side ones, then fill up about a foot and a half with small stones and the remainder with earth. If the stones be flat and slaty they may be laid in the shape of the letter A or the letter V, that is to set two flat stones apart at the bottom and join them at the top filled up on both sides, or the reverse,

open at the top and joined at the bottom and placing a stone on the top in such a way as to drop in a little between the side stones, then fill for a foot and a half with small stones and the remainder filled as before. It will be seen that the two former methods require the drain to be wider at the bottom than the last mentioned. In a soft quicksand bottom, soles must be used, but in solid tilly sub-soil they may be dispensed with. Deep drainage, which is principally to carry off spring water, I do not think requires to be filled to such a great depth with porous materials; I would recommend sod, or straw, or shavings, to be placed immediately on the stones followed by the sub-soil dug from the drain, and made solid, and the remainder filled with what remains of common earth, because the water should be drawn into the drain from the sides near the bottom of the drain, and not from the top. But tiles with small stones, gravel, or other porous materials over them is superior to any thing else, even in deep drainage.

So far these remarks allude to the necessity of drainage and proper management of land where the water arises from springs, and there is a large portion of our soils in Canada where, from the retentive clayey nature of the subsoil, the surface water does not pass away freely, therefore the subsoil is cold and chilly, and every kind of crop sown upon it grows stunted and slowly, therefore the season is far advanced before they cover the ground, in fact the best growing part of the season is lost. At this advanced period our hot sun and scorching winds commence with severity, carrying off moisture so rapidly by evaporation that the soil bakes, and the plant is held as it were in a vice, then, of course, soils in such a state cannot absorb moisture from above or below. To remedy these evils recourse must be had to thorough draining, that is cutting drains parallel with the declivity of the land at narrow intervals apart, the distances depending on the tenacity or porosity of the subsoil, the distance may vary from thirty to sixty feet, but so long as the water does not readily leave the soil, or any unnecessary moisture is retained, we may be assured that the full benefit of draining has not been attained.

Mr. Stephens says the depth of furrow drains should be from 2½ to 3 feet. I do not think that the frost would injure tiles or pipes at 2½ feet but when stone is used 3 feet would be required. The sub-soil on heavy lands is generally free from stones, therefore I think the cost of cutting might be greatly lessened by the use of the plough. I suppose a broad-cutting plough would cut eight inches deep by twelve broad followed by a narrower one lifting six by nine, thus making fourteen inches, then a subsoil plough succeeding loosening six inches more, to be lifted out with a scoop-shovel made for the purpose, a repetition of the subsoil plough would loosen five or six inches more, this in a 2½ foot drain would only leave four inches to be dug with the spade, which would be necessary to level the surface of the bottom for the tiles or filling material. Our subsoils are not quite so tenacious generally as those in Britain, our climate being much drier indeed.

me to think that the depth and distances before mentioned would be sufficient for this country, as to all filling materials there can be no question but that there are none so durable and efficient as pipes or tiles, covered to a depth depending upon the porosity of the soil with small stones, gravel, or other porous material. Formerly, in Scotland, a great quantity of furrow draining was done with broken stone or gravel alone, which had a good effect. I think that such drains can be accomplished at less cost than the tile drains, and as there is any quantity of beach gravel on the front, which is excellent for the purpose, and back in the country many gravel beds of limestone to be found which would answer the purpose, such drains might be constructed in some kinds of soil with great advantage. I think pipes made in the shape of wheel boxes tapering to one end so that the small end would enter into the larger about half an inch or so. Tubes of this description would be cheaper than horse-shoe tiles as there would be no soles required, and taking less material and being more durable. I have seen drains constructed with such pipes which had worked satisfactorily for near a century.

I believe that a great portion of the heavy lands in Canada are growing wheat at a loss, owing to the superabundant moisture in the soil. I hold the opinion that if they were thoroughly drained and properly cultivated they would produce 50 or 60 bushels per acre with a great deal less labor and much less uncertainty than they now produce 25 or 30. I will close my remarks by giving a few extracts from practical men corroborating what I have advanced.

A farmer in Lanarkshire who thoroughly drained one half of a 4 acre field and left the other half undrained, in 1838 planted the whole field with potatoes, and from the drained portion realized £45, while the undrained only realized £13 per acre. Another instance of drainage—on the estate of Lord Hatherton under the direction of Mr. Bright; the soil was of a light nature resting on subsoil of stiff clay, the results are these—466 acres drained at an outlay of £1508 give a yearly increase of £435 or 29 per cent on the capital expended. Mr. George Bell of Aberdeen mentions the produce of potatoes on drained land to be 175 cwt. per acre, while that on undrained land of the same quality gave only 70 cwt. per acre, these are quotations from English works. I will now give an instance of two from our American neighbors. J. Johnson mentions that on drained land a crop of wheat, heavier says he, I never saw stand, was reaped from this ground; he draws his tiles a distance of three miles from the factory, and finds under draining to cost him about 30 cents per rod, and two rods distant asunder—or 22 dollars per acre, he finds horse shoe tiles objectionable from their liability to become filled from washing of the earth beneath them, and tubular tiles the only kind to be secure from this accident. J. G. Yeoman who has constructed nine miles of tile drain finds nearly an equal advantage on his light loam land, generally thought to be quite dry enough; the large amount of water discharged in one instance

at the road side from his tiles furnished a practical illustration of the need of draining, to those who observed it, stronger than all the books ever written on the subject valuable, as they may be; he brings his tiles from Albany 30 miles, and finds the drains to cost 40 cents per rod, about 3 rods apart, or 24 dollars per acre. Another farmer laid 12,000 tiles this spring, he says nothing pays so well as this business. Col. Sherwood of Auburn has laid 14,000 tiles and their benefit is already so obvious that he intends to lay more as fast he can. Judge Buell who laid two miles of tile drain procured them in Albany at an expense of 23 cents per rod for tiles alone, which afforded a passage for the water 4 inches square, he uses soles for the bottom.

Mr. J. WADE said, that Mr. Black had crowded a great deal of valuable information into the essay he had just read, and as Mr. B., had had a great deal of experience it might be implicitly relied upon.

There was no subject of more importance than draining to those who had springy or retentive soils, and though few farmers might be able to do all they wished, it was well to have a proper understanding of the subject, so that what they could drain might be done to the best advantage; one draw back to draining was a want of proper material to fill them with, he had never found a material that altogether pleased him. Horse shoe tiles used to be the great thing for filling drains with, but he believed they had now found that pipes fitted at the points with the collar did better, and could be made cheaper than tiles; he had used wood for pipes where he had drained, sawn one inch thick by three inches wide to set along the sides of the drain and a board four inches wide to cover on the top, but he thought that if he had laid any more drains with wood, he would use four boards, putting one in the bottom, as he found where the subsoil was loose the drains were apt to run out in places where they had much descent, and fill up where they were level, he had put in more than a mile of such drains on his farm, he found that in a field where about one-fourth used always to kill out when he had it in fall wheat, now since he had put drains in in the parts of the field that used to winter kill, now produced the best crop; he thought that at the present high price of land, those farmers that had money to invest would do better to invest it in draining and improving what they had, rather than to buy more land, as one hundred acres was easier managed than two hundred, and he believed that if properly drained 100 acres might be made to produce as much as 200 do now.

Wheat was killed by water standing on it in the spring, and there was no other method of getting rid of the water but by draining; he thought they would be encouraged to drain by getting pipes and tile at a cheap rate—in Britain they had a machine that enabled them to make pipes very cheaply; he thought that a good deal might be done at draining with machinery, so that little hand labour would be required.

Draining was regarded as at the foundation of all good husbandry in Britain, it was only at first

that draining was costly, as drained land was much easier wrought afterwards than undrained; we need make no costly experiments in draining, as we had all the experiments of others to go by.

Mr. HAYWARD said, that his family had been very extensively connected with British farmers, and he was never happier than when amongst them. He had come here to-day to enrol his name, and would be always glad to meet and learn from them. His farming was on a small scale, and as he had no experience in draining he could take no part in their discussion this time.

Mr. MASSON said, the first thing he would do would be to carry away the surface water, as he did not think that under draining would pay at all; he had drained some land since he came to this country, but it did not turn out what he expected; it did him no good and was labor lost; he would make open drains and water furrows, but would let stone and tile drains alone, as he did not think they would pay at all; he had had the best crops on the part of his farm that was wettest in the spring—possibly on spongy ground an under drain might pay, but not on such land as he farmed.

Mr. P. R. WRIGHT said, he was surprised to hear so many of them advocate underdraining, as for his part he did not think that subsoil draining was profitable here; there was a vast difference between this climate and the climate of Britain, where most of them took their experience from. Though he believed that more rain fell here than in Britain, yet it fell, or a great part of it, on the land when it was in a frozen state, and another part fell on the ground when it was so dry that it required all the rain that did fall; he thought that land ought to be properly surface drained; though his farm was very level he never allowed water to stand on it either in spring or fall; he thought that dry land was as much the better of draining as wet was, as dry land was made more moist by under draining, as it allowed the rain to pass freely through to the drains while the land retained some of the gases; he approved of making leading open drains to carry off surface water. He farmed for the purpose of making money, and so far he had been pretty successful, and he thought they would find their profits much more increased by surface than by underdraining; it would take a great deal of persuasion to make him undertake to drain land as they do at home. He did not wish to be misunderstood, he was no enemy to underdraining, only he did not think that it would pay; he would like to see a field taken and one half of it thoroughly drained and the other half left undrained, and then put the field through a rotation of crops and see if draining would pay, for his part he was satisfied it would not.

Mr. PHILIPS said, that in this country there was such a difference in the nature of the soil, that the system that might pay well on one farm might not answer for the next one, so that scarce any two could be carried on alike; he believed that Mr. Wright's farm though level, was a very peculiar one, and did not need underdraining; he thought that our highest rolling land was most subject to springs, and that underdraining was

most beneficial on them; he approved of making deep open leading drains through a farm, as the lay of the land might require, which not only dried the land along side of it, but it allowed you to put in under-drains where they might be required, which you could not do unless you had a deep leading drain; he approved of Mr. Black's method of filling drains with stones, as about ten years ago he had put above a hundred rods of drain in a field and filled them with stones, and they were as good as ever yet, not a hole had broke in, before he put the drains in that field it was impossible to get it sown in proper season, in the spring now it was the first dry ground on his farm, any person going on to that field when the crop was growing, could tell where the drains were, as for forty feet on each side of the drains was always a better crop than the rest of the field, he would prefer drains put in deep, he advocated deep underdraining according to a farmer's means, he would make open drains through swells.

Mr. BOURN said, that he had no experience in draining, but he would mention that he thought that a good deal of the rough cedar in our swamps that would not split for rails, might be sawn up for material for filling drains with after the method described by Mr. Wade, but he would prefer the side pieces to be of two inch thick; he thought that drains filled with stones were apt to wash and fill up.

Mr. TAYLOR said, that he thought that drains ought to be made in the spring of the year, so that the filling in had time to become solid before the fall rains, and then they would not be so apt to wash in holes to the drain; he had put in about thirty rods of drain, six feet deep at the bottom of a side hill, and he always found water at the mouth of this drain, it served him for a watering-place for his cattle in winter, and had enabled him to break up several acres that he never could plough before he had made that drain.

Mr. D. BLACK said, the most of his farm was dry land that did not require draining, but where he had made drains he just put three rails in the bottom of the drain, and on clay subsoil he found this plan answer very well but where there was quicksand they soon sanded up and became useless.

Mr. J. UNDERWOOD said, he was in favor of draining, if he had a farm of his own he would certainly drain it; he thought that open ditches ought to be made to prevent the water from running off one field on to another, and such a ditch would enable you to drain water furrows where necessary; he thought that underdraining was best though it would cost more at first, but when once well done it did not need to be done again, whereas open drains need making and cleaning out every season; he had seen drains made here in a strong clay subsoil—first dig about two feet deep and about fifteen inches wide, and then with a narrow spade made on purpose, dig about six inches wide and six or eight inches deep right along the middle of the drain, and then lay on a slate in the bottom of the drain, covering the smaller drain, and it seemed to answer very well.

as these drains had been put in a number of years and he had never seen any of them break in.

Mr. PRATT said, drains were things he had never seen made in this country, but every one knows that wet land ought to be drained, and when wet land is drained it would give a greatly increased crop. On clay soil he would not approve of tile drains, as tile drains did not draw well; on such land he would prefer drains filled with stones as they drew far better.

Mr. DIXON said, with regard to drains, he had dug a great many of them, and he thought that nothing would pay a farmer better in this country than draining; all that he had seen put in had paid well; he thought it was the duty of every one who owned land to drain as much of it as he could.

Mr. FORSYTH said, he thought drainage was very useful where the land was at all wet; he had seen draining do a great deal of good in Britain, but it would be very expensive here; land wrought a great deal mellowed, and manure did it more good when the water was taken off the ground.

Mr. GEO. UNDERWOOD said, he was perfectly satisfied that draining would pay; this makeshift system that we followed here might do while the land was new, but by and bye we would have to try some better system, and he had no doubt we would have to drain the land; he would prefer stones and tiles to any other material for filling drains with; he believed that underdraining would pay fifty per cent. on the cost; if land did not pay for draining, it would not pay without it.

Mr. ALCORN, in summing up said, that after the lengthened discussion we have had, he would not detain the meeting with any very lengthened remarks. Draining was, no doubt, of very great importance, but to go to the extent of thorough draining as they do in Britain, he believed that he could hardly afford that yet. One very important consideration was, that manure did very little good on wet land, and when the ground was wet, it was impossible to get the crops in, in proper season in the spring; he thought that underdrains should be dug at least three feet deep, and filled in with a pipe or tile at the bottom, and then about a foot of small stones above the tile. Where stones or tiles could not be got, he would use cedar or pine or any other durable wood; he would not think, in our present circumstances, of putting a drain in every furrow as is done where thorough underdraining is undertaken, but he would put them first in the low wet places, which are to be found on almost every farm, and which every farmer can point out where drains are necessary. On farms that are not springy or troubled with low damp places, open drains and water furrows would answer every purpose for the present, but as our lands get older, underdrains would be more needed. He quite agreed with Mr. Black's essay, and highly approved of his methods of draining.

A vote of thanks was given to Mr. Black for his able essay.

The next meeting of the Club was appointed

to be held at Dixon's Inn, Court House, on the last Saturday in February, at 2 o'clock p.m.

The subject for discussion to be Artificial Manures, to be introduced by Mr. Wright.

WALTER RIDDELL,
Secretary.

GUELPH FARMERS' CLUB.

Subject—CLEARING LAND.

On Friday, February 10th, the monthly meeting of this Club was held at the British Hotel, T. Saunders, Esq., in the chair. The room was well filled and James Loghru, Esq., delivered the following address:—

Mr. President and Gentlemen,—

So various are the means and circumstances attending the first settlers on their first settlement in the woods, that it would be impossible to lay down any general rule that would apply equally to them all. I shall therefore take the three following classes, as most likely to include a majority of the first settlers, and make a few remarks as to how they are likely to succeed; and then make a few remarks on the best and most profitable mode of clearing land. The first class of settlers I would notice, is the man that comes in without any means with him whatever; the second class is the man that has the means of paying for his farm, and keeping his family in provisions for the first year; the third class is a man that has the means of purchasing a farm, paying for clearing it up, putting good buildings on it, and making any other improvements he pleases on it. These three classes I take to be emigrants from some of the old countries, as men that have been in this country for any length of time know, or at least ought to know, how the first settlers succeed in the woods.

The first class is the man that comes to this country without any means, and perhaps a small family, and not even the means to support them for six months of the year. Many who are acquainted with the way that new settlers get along in the woods, would be inclined to say that this was a hopeless case, to talk of a man of this description buying a farm and paying for it, and clearing it up at the time; to such I would say, their case is anything but hopeless, for there have been hundreds and thousands that commenced under similar circumstances that have made their way through, and are now enjoying all the comforts this world can afford, and are as independent as any people on the face of the earth can be.

First we say that a settler of this description purchases 100 acres of land, at £1 per acre. If he can get good land for that, it will be cheaper than poor land would be at 10s. per acre, and he has 8 or 9 years to pay for it, say 8 years, with interest. The first thing is to raise a shanty on it for his family. The first year he will have to work out 8 or 9 months of the year, to make as much as will support his family, and get a cow; so that the first year he will not raise as much as

will support his family the following year. The second year, he will perhaps have to work out 3 or 4 months; but this year under good management he will raise plenty of provisions to keep himself and family. The third year he can work the whole of his time on his own place, and this year he will have a part of his crop to sell; but then by this time he wants a barn, waggon, and sleigh, and a yoke of oxen, if he has not got oxen before, and many other things, that it will take all he can spare, and more, to furnish his wants this year. The fourth year he still continues on improving and clearing up his farm; by this time he is getting in more comfortable circumstances: he raises his own provisions, and his own clothes, and has got most of the necessaries that are wanting on the farm, such as a house, barn, and farming implements, &c., but then there are 4 years past, and nothing paid on the land as yet; by this time the principal and interest will amount to £124; if there is compound interest, it will amount to more. The fifth year, this will be the first year that he can pay anything on the land; this year he may pay say £24, which will leave £106 to pay. The sixth year he may pay say £30, which will leave £82 to pay. The seventh year he may pay say £40, which will leave a little over £46, which he may pay off the eighth year; thus it will be seen that this class of settlers, in the course of eight years, will have a deed of 100 acres of land, and their farms partially cleared up, with their families growing up around them, and enjoying all the comforts of life.

In the above statement there will a good deal depend on whether he can get the land on the terms of payment I have stated; if he must pay a certain sum down, and pay up the instalments as they become due, he will have to work out a certain time to make as much as will pay a few of the first instalments.

It is pleasing, sir, to go into any part of the country that is settled with this description of settlers. After they have been in a few years, you will generally find them as contented and happy as any people on the face of the earth can be, with the prospect of a comfortable home for themselves and their children after them. Their food and clothing are coarse but comfortable, and their food is wholesome. Their wants are but few and easily supplied; for that unworthy customer, Pride, has not made his appearance among them with all the evils attending him.

Before leaving this class of settlers, I would say to them, be careful of getting into debt at the first settlement for anything but the land, but especially in the stores, for you will find that creditors have long memories, are very sceptical, and great observers of times and days. I think the best plan for new settlers, if they have their food and clothing, is to try and do without other things, until they have the means of paying for them. Then, again, there are credit sales, which it is common for settlers to go to, but which I think they would do well to keep from. There they generally get the worst and most useless articles, and have to pay the highest price—often a third more than they are worth. I never knew

any one make a fortune by going to them, but have known many to have lost by them.

The second class of settlers are the parties that have the means of paying for their lands and keeping their families in provisions for the first year. No doubt, one of this class has a great advantage over the first; he not only has a better chance of having the pick and choice of the land, but he can go where he pleases and purchase for it is generally said that a man with the needle in his pocket can make his own bargain, and no doubt he can purchase to better advantage than if he had not the wherewithal. Then, again, he has another advantage: he can work all the time on his own place, and if he should get out of his place in time—say early in the fall or immediately after the harvest—he may raise abundance of provisions to support his family the next year. Then the next year they will have a part of their crop to sell; and from this time they will have something to spare to lay out on clearing their farms, if they wish to do it, as they have nothing to pay on their land. Thus it will be seen that this class has a decided advantage over the first class, for in five or six years they will have a much done as the first class will have in nine or ten.

We come next to the third class, or the parties who have the means of purchasing a farm and paying for it, paying for clearing it up, and making any other improvements on it they wish for. This class has a decided advantage over either of the other two, so much so that most people would be inclined to think that there can be no danger of them—a man with plenty of the needle with him can live any place;—but to this class I would say, be careful. It is true there are many of this class that have not only cleared and improved their farms, but added largely to their own capital, and have been a great benefit to the country around them; but it is also true that there are numbers of this class who brought their means with them to make them almost independent, that through their own mismanagement, leaving the management of their affairs to others, have made a wreck of their fortunes, and left themselves to begin the world again at a time when they would most need something to live on. Never was there a case that the old adage would apply to better than this one:—

“He that by the plough would thrive,
Himself must either hold or drive.”

Farming is like every other calling or occupation if you wish to be successful in it you must attend to it yourself, and be on the place at all times both late and early. I have been told that keeping a good foreman would do as well; but I never well that may work in the old country where every thing is wrought into a system, must say that I have never yet seen it succeed well in this country, especially on new farms. The man that wishes to live by farming, ought to make up his mind to superintend the work himself, and he ought to know and see when his work is done, and how much ought to be paid for a day's work, or for the wages he is paid for it, which is not easy to do unless a man

take hold himself. The man that cannot do this had better try some other occupation. I think this class of settlers would do better by purchasing improved farms, than by settling on new ones.

This brings me to that part of the subject,—“The clearing of land, or the best and most profitable mode of clearing land.” When the woods are cut down in winter, to be cleared off in the spring, as is the case with new settlers, particularly the first and second class, the best way that I know of is, when the tree is cut down, to cut off the whole of the limbs or branches, and pile the brush or tops of the tree well together; for if any of the branches are left on the tree, they will generally bud in the spring, and consequently there will be more difficulty in burning them; and if the brush is not closely piled together, it is hardly possible to burn it early in the spring. And I would also recommend cutting the logs short, say 15 or 16 feet, but at most not more than 18, as the short logs are more easily drawn and put together, when the timber is green, and they will perhaps burn much better than if they were longer. But this mode of chopping in the winter and logging in the spring should be abandoned as soon as the parties have land enough cleared to keep their families, for it is a laborious work, and I think not so good for the land; then, after the first difficulties are over and the parties can do without logging it off in the Spring, (I mean the first and second class settlers, that take a hand in clearing their own land, and can let the logging remain over to the summer, I find the best and cheapest way to clear land is to slash it. What I mean by slashing is, when the trees are cut down to fall them into large heaps, the larger the better,—and I would have all the limbs cut off, and would prefer round heaps to wind-rows. In the first you can put solid timber on the top of each other, as the trees can be felled all round into it, so that the tops will all come into the centre; and there will be nothing but the butts of the trees lying out, so that if there is a good urn of the brush, the whole of the middle of the heap, both small and great will be burnt up; whereas, if timber is felled into long wind-rows, there will be some thin, and not much timber piled together; so that there will not be so much burnt up with the brush. If slashing is done in the winter, to be burned next summer, it should be done early in the fall; otherwise it would be better to let it lie over a year before the brush is burned. In all cases it would be better to let it lie over a year, both for the land and on account of its being so much easier logging, for there would be great deal more of timber burnt up with the brush; but here I would not be misunderstood: to be successful in slashing, requires a man that has had some practice at falling trees. I have seen slashing done with the trees felled obliquely back and forward across each other; they were felled wherever the trees were wanted to, and the brush not half piled; I would rather have the trees standing in the woods than have them cut down as those were. On the other hand, I have seen slashing done that I could as soon have it as most of the chopping that is done in the country. I had at one time

20 acres slashed, for which I paid 15s. per acre, with board. I got a good burn of brush, and it took 21 day's work of a man to cut it up, and leave it ready for logging; so that it was but a little more than one day to the acre to chop it up. It is true the logs were not cut short, but it was speedy logging. But, a great deal of this depends on a good burn of the brush.

As to chopping up of the trees into logging lengths, little can be said about it, as much depends on the nature of the timber, the weather, and the length of time it is chopped. If the weather be favourable, and hard wood timber, and it has been chopped over a year, very little cutting up will do it: and here, I would observe, it requires a man that has some practice in logging to do it. If you get a man that is unacquainted with chopping and logging, you will likely find that one-half of the cutting he has done is useless altogether, for he very often cuts where there is no need for it; and it is most difficult to convince them that they are wrong, if they are from the old countries, and well up in years. I think the best way to teach them is to let them chop and log a piece themselves, and then put them into a piece of good chopping to log: they will then see the difference.

Then, as to fencing, I would say to all new settlers, what fencing you do, do it well, whether with logs or rails, and you will find you will be great gainers by it in the end. As to brush fences, I think they are a curse to any settlement, as well as to the owner of them. They are a great means of making breachy cattle, and of getting the crops destroyed that are on the inside of them.

We come now to what more immediately concerns the third class of settlers: to inquire is it profitable to invest money in clearing land?—I think, the following statement will prove that it is. We shall take a field of ten acres, for four years, by way of experiment, and give a statement of the probable expense of clearing and fencing the land: the expense of putting in the crops, and taking them off, and of sending them to market: the last item of taking to market, I shall assume, as is the case with new settlements, that they have some thirty or forty miles to drive to market:—

Clearing and fencing ten acres, £4 per acre, £40	0	0
The first year in wheat, seed 13 bushels, 5s		
per bushel.....	3	5
For sowing and harrowing.....	1	15
Harvesting and drawing into the barn....	4	0
Threshing and cleaning.....	4	0
One year's interest on £40.....	2	8

Total expense.....£55 8 0

YIELD OF THE ABOVE CROP.

20 bushels per acre, 200 bushels,		
at 3s 9d per bushel.....	£37	10
Deduct 7½d per bushel for taking		
to market.....	6	5
	£31	5
Remaining due on the land the 2nd year..	24	8
Two ploughings this year, one in the fall		
and one in the spring.....	7	10

Carried forward.....£31 13 0

Amount brought forward.....	31	13	0
20 bushels seed barley, 2s 6d per bushel..	2	10	0
Sowing and harrowing.....	1	5	0
Harvesting and drawing into the barn....	3	15	0
Threshing and cleaning.....	4	0	0
Interest on £21 2s.....	1	10	0

Total expense.....£14 13 0

YIELD OF THE ABOVE CROP.

30 bushels per acre, 300 bushels			
at 2s 6d per bushel.....	£37	10	0
Deduct 6d per bushel for taking			
to market.....	7	10	0
	£30	0	0

Remaining due on the land the 3rd year..	14	13	0
One ploughing this year for Oats.....	3	15	0
20 bushels Oats for seed, at 4s 4d.....	1	5	0
Sowing and harrowing.....	1	0	0
Harvesting and drawing into the barn....	3	0	0
Threshing and cleaning.....	4	0	0
Interest on £14 13s.....	0	17	6

This year the land should be seeded down:
 Timothy seed, 1½ bushels, 15s; Clover
 seed, 1½ bushels, £1; sowing, 5s..... 2 0 0

Total expense.....£30 10 6

YIELD OF THE ABOVE CROP.

40 bushels per acre, 400 bushels at 1s per			
acre, taken from the barn.....	20	0	0

Remaining due on the land the 4th year..	10	10	6
This year the land is in meadow, and to let			
it in any way they please, either to get			
it cut on shares, or any other way, it is			
worth £1 per acre.....	10	0	0

£0 10 6

which will come within 10s 6d of paying off principal and interest

In the above statement I have not taken into account the interest on the original cost of the land, nor the interest on the expense of putting in the crops, from the time the crops were sowed until they were sold.

Thus it will be seen that in four years the whole amount of principal and interest will be paid back; the land cleared, fenced, and seeded down, which will be 25 per cent of clear profit, exclusive of 6 per cent interest.

The above statement, I think, will stand the test of any ordinary year, and under any ordinary circumstances. I would not wish to send a statement out to the public, in any way that might be the means of leading any one astray. The expenses of working the land are given at the outside figure; the parties to find themselves and their team in board, which ought to be given up as soon as the owner of land has raised provisions to keep both men and teams. A farmer should always employ his teams, and board his hands, which would make a very different look on the above statement. The yield of the above crops is taken as such as may be depended on; and the prices are such as there would be little difficulty in obtaining in any ordinary year. It is true there have been many cases more successful than the statement I have made. I have seen some of the first crops of wheat more than double what I have stated it at, and the barley and oats at a third more than in the above statement;

and prices at a high figure, I have often where parties have been so fortunate with their known the first crop pay all expenses of cleaning and fencing the land, but this cannot be depended on in a general way.

I shall now make a few general observations on chopping, logging and cropping, of the new land, as there are many of the emigrants that come here and work to great disadvantage at the first clearing of their farms. We will begin with underbrushing: all the poles and brush 6 inches in diameter, and under, should be first cut close to the ground and piled into heaps: the next thing in chopping is to cut the large trees first, and get them close to the ground if possible, when there will be no need for cutting them up; if the large trees be felled across smaller ones, it will be necessary to cut them up, and many a hard stroke might be saved had there been proper care taken in felling the trees at first. When first went into the woods, there was an impression on the people's mind that it was best to fell the trees across each other; after trying it for a time I found this was a mistake. It may do to take two trees across each other; they may be taken in together, to log to; but if there be 5 or 6 felled across each other, as is the case with most of the hands when they commence chopping, the logs will all be to draw before they can be logged; whereas if they had been felled along side each other with the largest trees felled first, there would be no trouble, but commence rolling the logs together at once, and many of them would not have to be drawn at all. After the log heaps are up and set on fire, they should be attended to,—roll them together two or three times a day.

Then as to cropping, I think that there should be no more than three grain crops be taken off the land, until it is seeded down. By doing this the land will not get grown up with switch grass, or other dirt; and the crops of grass will be much better. In following this plan, the parties will find that if they should clear five or ten acres a year, that in nine or ten years, if they wish to give up clearing, the first that is chopped will be ready for breaking up, and the stumps will all come out, if hard-wood timber.

WATERLOO FARMER'S CLUB.

Subject,—BREED OF SHEEP BEST FOR CANADA.

The second meeting of this Club was held at the Union Hotel, Galt, on Saturday afternoon last.

A very numerous attendance of Farmers took place and all seemed interested in the discussion. Some forty members enrolled themselves, and chose Mr. James Cowan, President of the Society.

Mr. Cowan, in taking the chair, remarked that he looked upon that day as the proudest one of his life. Farmers were generally proverbial for holding back from those unions which were

readily adopted by other classes; but the numerous meeting gathered around him would destroy this idea, as far as the Farmers of Dumfries were concerned. There were ten times as many present as he expected to find, and he could not forbear congratulating the Club, upon its auspicious beginning. The discussion that afternoon was upon the breed of sheep best suited to Canada, and the best way of treating them. He would call upon Mr. J. D. Campbell to open the discussion.

Mr. Campbell remarked that it seemed strange for an old soldier to get up and speak of the merits of Sheep, particularly as there were many old shepherds present from some of the best sheep-producing parts of the old world. He had been in Canada now some thirty years, and he could assure them, that at the time of his arrival the breed of Sheep in Canada was a very bad one. But although the breed was a most inferior one, he always kept a few sheep, struggling on with them in the hope that better days were coming. Until about sixteen years ago, however, no improvement took place in the breed; but at that time Mr. Holmes (the speaker was understood to say,) near Paris, bought a Leicester Ram, of which he (Mr. C.) secured a lamb. Mr. Thompson of Waterloo, afterwards imported one, and there were some brought from the neighbourhood of London. To the Leicester Ram he procured, he put two Ewes, and had two lambs by them, but the breed gained very little. He got another Ram, part Leicester, and procured a change in the breed by means of Mr. Thompson's Ram, which had taken the prize at all the Dumfries Shows. *The first cross was always the best.* (Hear, hear.) If farmers were desirous of getting good sheep, let them look after the proper breed, and then take care of them. They should be fed on Pea Straw and Hay. He had tried and always found that the first cross milked the best. Last year he had 75 sheep, which he fed on hay, and got on an average $5\frac{1}{2}$ pound of clean washed Wool from them, which he sold for $35\frac{1}{2}$ cents a pound.

Mr. FERRIE.—How many Lambs in the flock?

Mr. CAMPBELL.—Thirty-four, off some of the Ewes he clipped as much as eight pounds.

Mr. FERRIE.—Was the first cross better than the offspring of the first cross?

Mr. CAMPBELL.—Yes! If a farmer bred a large flock, and only an eight-acre of pasture, he must change them often, for sheep require not only good but clean pasture, in order to do them justice. (Hear, hear.) When he fed hay, he always salted it, and he found that this system produced better sheep. If he were to begin farming again, he would buy the best Leicester ram he could procure, and four or five common ewes. He had crossed his breed now for fifteen years, and had got now a good stock of sheep, but crossing, if carried too far, would not be found to answer. Sheep must be taken care of.

Mr. COWAN.—Whether did the breed they found in Canada, with the usage and feed they got or the improved breed, with their keep and usage, pry best? Was the difference in the return owing to the breed or feed?

Mr. CAMPBELL believed in feeding, it was the *weight* which paid. Were he again to commence sheep-farming, he would go to the back settlements, buy the coarsest ewe he could find, and put her to a Leicester ram. Put a Southdown ewe to a Leicester ram, and they would have the best mutton, which would always bring more per pound than any other. The condition of the sheep all depended upon its keep. When he came to this country he could clip more than half a pound from each sheep; now his average, as he said before, was $5\frac{1}{2}$ lbs. He had sold eight ewes, and eight lambs to an American last season, for which he got \$105. When he came, he wouldn't have got \$2 a-head. It was an old Scotch saying,—“What goes in at the mouth comes out in the butt.” The best sheep for Canada, as regards weight of carcass and wool, was the Leicester, but they must have better feeding. He would change his breed every year.

Mr. Campbell was cheered on sitting down.

The Chairman here called upon Mr. Daniel Tye, who, he believed, dealt in Southdown sheep.

Mr. TYE agreed with Mr. Campbell as to the fact, that the first cross was best for butcher and farmer. The Southdown was very little known in this country, and as long as Leicester mutton would bring as much as Southdown, and produce more wool, the Leicester was the Sheep for Canada. But Southdown mutton, in quality, was far preferable to any other,—for instance, in the London market it brought 2d. to 3d. per pound more, and he believed that as soon as the mutton came to be exported to city markets, instead of being home-consumed, the Southdown would be acknowledged on all hands as the best. The Cheviot sheep made a very handsome carcass, and they ought to receive premiums at the Shows equal to Southdowns or Merinoes.

Mr. Wm. Bruce coincided with what had fallen from the previous speakers. The Leicester sheep in its first cross was the best sheep, and he had crossed with all breeds. Ultimately, he thought, the Leicester sheep would decrease, as a mutton-chop could not be cut off him. By all means get the male superior to the female in crossing, and get the best bred Leicester ram, as the higher the breed the greater the disposition to fatten. Use them well, give them plenty of food, and good shelter, and they would never regret it.

Mr. ANTHONY MARSHALL being called upon, said the best half-breed sheep he ever saw belonged to Mr. Brack, of Clinton. The gentleman kept half-bred rams for use, as he couldn't keep up the breed without them. The half-bred rams get good sheep.

Mr. W. BRUCE knew Mr. Brack, who went and got half bred rams at the time of castration, and his own stock being half-bred he always managed to keep that breed.

(Here several gentlemen stated that this was the plan generally pursued where they had come from.)

Mr. COWAN said that some years back he became so certain that his sheep were degenerating, that he at once bought a Leicester ram, but as yet

there had been little improvement. The cross he had had between a pure Leicester ram and a Canadian ewe had come up in quality to what he expected, and he had begun to believe that the half-bred sheep was not what it was said to be. The progeny of the Leicester ram he thought inferior to the rest of his stock.

Mr. WILLIAM WELLS fed his sheep on hay through the winter. About the time the ground began to get black he gave them a few peas, as that was the time sheep generally fell off, if they did not get something to keep them up. He had only got about twenty sheep, and gave them about three bushels of peas through the month. He let them run through the year with the rest of his stock, and he considered, that running in that way, they paid as well as the latter, and thought he could keep eight sheep for one cow, taking all seasons into account.

Mr. DICKIE believed that Sheep paid better than Cows, and that six of the former, could be kept for one of the latter.

This closed the discussion, which throughout was well kept up and exceedingly interesting. The next discussion will be held on the last Friday in March, at 1 o'clock. Subject—"The best kind of Roots, and the best modes of cultivation." Mr. James Dickie to open the discussion.

EAST ZORRA FARMERS' CLUB.

Subject.—FENCING.

A meeting of the East Zorra Farmers' Club was held at Lappin's Hotel, 12th line, on Thursday, the 9th of Feb. Mr. Turner in the chair, the Secretary being absent, his place was filled by Mr. CROPE.

The Chairman having opened the meeting, Mr. COOKE read as follows:

MR. PRESIDENT AND GENTLEMEN.—Fencing is proposed for this evening's consideration, and I suppose it will be expected I should mark out a line different from our old established zigzag rail fence, but sir, my opinion is, that we as farmers in this township generally, have plenty of rail timber, or can buy it at a reasonable price, I think Sir, that we cannot in the majority of instances turn our attention to any mode of fencing more to our advantage; I know, Sir, that it is called by some men unsightly, but I have always thought that a farm well fenced in convenient fields did not look unsightly, I have heard Englishmen say the same. I would say that every man ought to fix up a straight fence in front of his dwelling, of posts and boards or pickets, and in particular his barn yard should have a good tight board fence around it to keep the wind from blowing the fodder out of the yard or in one corner, so that the master beast gets all the supper and leaves the rest to starve. I think, Sir, if we cultivate our farms well and put up good substantial homes for ourselves and our cattle, we for our own part need not take much thought for the more expensive sort of fence; we have borne the burden and heat

of the day in clearing our land, and I should like to take as much as possible from it, with a small outlay, with an eye always to a right system of cultivation, and leave the next generation to construct any fence that best suits their taste or convenience. With these remarks, Sir, I beg to leave the subject to some one better able to do justice to it.

Mr. JOHN SMITH. In taking a view of farms as they are at present, I think it is a duty to give this thing a serious consideration. When I came to this country I brought a few seeds in my pocket, intending to plant them here. I have planted an English thorn in this country and it is doing well. If I had a family here I would plant the inside of my farm with thorn fences, they will be expensive at the commencement, but after being brought to a proper size will be the best fences, because they will stand from generation to generation. We are well aware that our wooden and rail fences will soon be at an end, and I think we ought to consider about our future ones, with respect to thorn fences in particular, for I feel it my duty to make my fences permanent.

Mr. KING said, I do not understand the plan of raising thorns in this country, but in the old country we used to plant them in hedges as soon as they were three years old, along ditches, two feet and a half wide, and I would approve of the same plan in this country.

Mr. DALE. Well, gentlemen, I am very happy to see such a large company assembled for the purpose of improving fences. I approve of the plan of thorn fences and would be very happy to see them, along with every other improvement. When I was in the old country, I rented a farm of a gentleman, that was divided into fourteen large fields. My landlord told me to do as I wished with the farm, to the best advantage. I divided these into smaller portions with good thorn fences, when the quick began to grow it made a permanent fence in five years, needing no more expense. I hope they will have as good fences in Canada as there were when I was in Yorkshire. There is another thing I have to allude to; when I was in my boyhood my father planted some quicks, and before I left him he had excellent fences.

Mr. GRAFTON SMITH. I am very well satisfied with the former remarks concerning English thorn fences. There is another advantage in having them, that is there is a ditch required, which is not only of use to the fence, but also in draining the land. As for my part I shall try the benefits of a thorn hedge round my garden before a great space of time has expired.

Mr. DONALDSON. Mr. Chairman and gentlemen, the only remark I have to make is this. I perfectly agree with Mr. Smith respecting thorn fences, but at present I think we are a century or two too early. In the younger part of my life I was employed to protect thorn fences. Planting however, a thorn fence ten inches apart, it would take a person all his lifetime to raise what would plant or fence five acres, and providing they did equally as well as in England, it would take ten years before they raise enough to finish a fence. In the first place, it would take five years for the

first growth, then they would require cutting and laying, and after that they would require protection, and a straight board fence will not require more than a third of the land the other would occupy. In the first place, a proper thorn fence would require to be five feet in the base, with two or four feet ditto; that is equal to thirteen feet and would occupy more room than any zigzag fences. A straight board fence will only occupy six feet clear from the plough, and if farmers have circumstances to do it, it is the cheapest fence that can be made. Until such time as they can be raised by practical men, I am of opinion that thorn fences cannot be put in practice.

Mr. MILMAN approved of thorn fences, but thought they could not do so well here as in the old country, they requiring a great deal of protection on account of the climate; banking he thought too was not so substantial as in England, and he instanced one portion of the Great Western Railway as a place that elucidated his theory. He would, however, be glad to see them in this country, if they could be made substantial.

After a few remarks from the Chair, a meeting was called for Donaldson's Hotel, on the 2nd of March. Subject—"Quality and varieties of seed."

A vote of thanks was then passed to the chairman for his conduct in the chair, and to Mr. Cooke for his paper, and the meeting separated.

Communications.

ON THE MODERN SYSTEM OF DRAINAGE, AND ITS APPLICATION IN CANADA.

(Continued from our last.)

No. II.

When in the exercise of his vocation the Engineer, the Architect, or the Mechanic, proceeds to lay out a Railway, erect an edifice, or construct a machine, he makes himself perfectly acquainted with the object to which he is about to apply his professional ability. He does not commence operations with vague ideas of what is to be attained, but he determines at the outset, by inspection and measurement, such a fixed and definite plan of his design: that by adhering to it he in due time arrives at that completeness of result which he was thus pre-assured would be accomplished. And this holds good in almost everything we undertake: for if work is begun with an imperfect perception of what is desired, it is more than probable the result will be equally imperfect. Let us, therefore first endeavour to understand clearly what it is we seek to obtain by artificial Drainage; and then consider the means by which it may be secured.

Now, the mechanical action of drains is two fold—the discharge of superfluous water; and the admission into the land of atmospheric and other influences—and in proportion as the work is effective in these respects will be its practical value. It may be asked then, in order to have some test of excellence whereby to judge of efficient Drainage: what is a fitting state of dry-

ness for land to be in to admit the greatest crops with the least compensating outlay? Fortunately we are not without unerring evidence to determine this point; for the transitions of strata are so numerous, and often so abrupt, that few can have failed to notice the more economical and certain productiveness of land on a naturally porous foundation, compared with the more precarious and costly yield of the strong and wet soils. We speak of the natural fertility, or otherwise, of these lands, as that arises from resting on an open or a retentive sub-soil; and we are sure that even the most cursory observer will be convinced that all the best and most productive land is that which does not require draining, because it is by nature suitably dry; whilst all the worse and least productive land is that which does require to be drained, because it is by nature too wet. Thus by the exercise of ordinary observation we arrive at the conclusion, that nature has on all hands set before us examples of land in the most suitable state of dryness for cultivation; and therefore, the more closely the same mechanical condition is secured in those soils to which artificial modes of drainage are applied, the more nearly shall we attain that perfection which is essential. There are, of course, many gradations of quality in the lands alluded to, but this does not affect the standard of suitable dryness which, from them, we would establish.

It could but little serve the great ends of practical utility to attempt to lay down arbitrary rules of depth, distance, &c., which experience and the ordinary operations of nature contradict: for if the advance which has unquestionably been realized in the art of drainage has demonstrated any one fact more than another, it is that no one plan of operation is equally applicable and effective on all lands; but on the contrary, that each case must be dealt with according to the circumstances of soil, sub-soil, contour, fall and meteorological situation. This is the province of the experienced Drainer, and his skill consists in so applying the remedy as that the work shall be complete and durable, whilst the cost shall not exceed a remunerative amount. We have laboured on many occasions to show that, whilst the strictest economy is exercised, completeness and durability are essential; and that it is the interest of the owner to secure these, even if at some additional expense, rather than by any temporary saving to jeopardize them in the slightest degree. The cost of Drainage is, under the most favourable circumstances, such as to justify the anxious desire of the proprietor to reap the full and permanent benefit of the application; and to the operator who understands and feels an interest in the work it is not the less satisfactory to know that all the anticipated results have been attained. After passing through the several probations of sod, turf, stick, wood, stone, slate, and common tile drains, the settled conviction has at length been arrived at in England, that the only perfect and permanent system of Drainage is with drains at not less than three feet deep, laid carefully with machine-made pipe-tiles of suitable sizes, and when needful, having the joints covered by a collar of the same material. The cost of

such work varies according to circumstances from about £3 to £1 10s., (sterling) per statute acre, on the more porous subsoils; and on the clay and stronger lands, from about £1 to £6. As evidencing the thorough satisfaction with which this system of Drainage has come to be regarded, it may be sufficient to state, that during the past 6 years the total outlay for such work in the United Kingdom cannot, on the most moderate computation, be less than six millions sterling; comprising an area of not less than a Million and a quarter of Acres; and, at the very lowest estimate, an increased produce of from eight to ten million bushels of Corn;—and yet the necessity for additional supplies is as great as ever; and the periodical anxiety for enough continues unabated.

Looking, then, at its geographical position, general contour, extent of woodland and water surface, the amount of rain-fall, and the comparative absence on the cultivated lands of channels for its ready removal, it may be fairly assumed that Canada would be as largely benefitted by an extended application of Drainage as the mother country. Stimulated by remunerative prices, which a population increasing at the marvellous rate of 101 per cent in ten years,* and, it may be, the protracted effect of European events, seems calculated to ensure, the Agriculturist of the Western world has every encouragement to adopt improvements, which, while they prove highly advantageous to himself pecuniarily, will add materially to the physical well-being of the community. Adopting at once, without having to undergo a costly and tardy probation, the present perfected system, he cannot fail of a full and early reward for his energy and enterprise.

Knowing, as we do, in how short a period the introduction of mechanical appliances will not only furnish a supply of the best materials, but at the same time bring the cost of the work within due limits, we feel assured that the expense of Drainage in this country will, under ordinary circumstances, very little exceed the English average. No doubt, at first, it may be somewhat greater, but if the high rental value of land in England, with the cost of Drainage in addition, be compared with the lower value of the land, and higher cost of Drainage in Canada, the balance will be still greatly in favour of the latter country.

To be continued.

* NOTE.—The increase in England is about 15 per cent in 10 years, which is thought to be very good—how much more extraordinary then is 101 per cent! It amply accounts for the gradual advance in the price of Agricultural produce in Canada during the past year of two, irrespective of the influence of passing events;—and will as certainly have its effects in future.

Dry, clean walks from the house to the street, the barn and other outbuildings, are not only very convenient, but in excellent keeping with a neat dwelling, fence and yards. The best house with mud all around it in rainy weather, not only looks bad, but is very unpleasant and the source of much discomfort.

ON THE EDUCATION OF FARMERS' DAUGHTERS.

To the Editor of the Agriculturist.

DEAR SIR,—In my last communication I stated my conviction that the outline of female education, as given by "H.," though excellent in itself, is not exactly adapted to the condition, circumstances, and prospects of farmers' daughters. Two important considerations which should influence female education are frequently overlooked;—first, the period for acquiring such education is very limited; and second, the female child was designed in her creation to be a wife and a mother, and she should be educated accordingly. That some do not become wives and mothers forms no available argument against the above statement, since they are the exceptions, not the rule. The period for acquiring female education being very limited, every subject which it would be desirable to study and learn cannot be attended to for want of time. The years which elapse between the period when the female child is capable of learning and the period when she becomes marriageable are very few. This being the case, those subjects should be studied which are of most importance to her own welfare, and that of the community of which she forms a part.

In selecting such subjects as a young female (a farmer's daughter, for instance) should study, let her parents or guardians keep in mind her high destination; let them recollect that, in all probability, she is to be a wife and a mother; let them recollect that her influence, for weal or woe, over the present and future generations of mankind cannot be easily overestimated, and in view of her usefulness in the present world, and her happiness in the world to come, let her education be such as shall best enable her to discharge her duties to her husband, to her children, to her parents, to her other relatives, to the neighborhood in which she lives, to the community at large, and to her God. That young female has received the best education who is best prepared to discharge the various duties of child, sister, wife, mother, relative, friend, neighbor, and Christian.

In writing on female education, let it not be understood that I confine my views to what may be learnt at school. I consider the female child to be pursuing her education just as much, when under the direction of her mother, or other instructor, she is learning to sew, knit, spin, wash, make butter or cheese, or any other household work, as when studying geography or English grammar at school; so that by female education I mean that entire training by which the child is taught to know and to do whatever should be known or done. When Agesilaus, King of Sparta, was asked what things he thought most proper for boys to learn, he replied—"Those which they ought to practice when they come to be men." The same may be said of girls,—they ought to learn in youth those things which they ought to practice when they come to be wives and mothers. There are two errors regarding female education which should, if possible, be avoided. I have known farmers' wives,—intelligent, industrious women, the mothers of several daughters each,—

who, as soon as their children were capable of learning, have sent them to school, and kept them at school till they were marriageable. They were instructed in all those branches of education generally taught in schools for young females. Those mothers, meanwhile, working themselves out of health and life at home, have taught their daughters no domestic employment. These daughters have left school, very delicate, slender-waisted, lily-fingered young ladies, and said to be well educated, whereas if a young farmer should choose such a one for a wife, he would find to his dismay, that for all the purposes of house-keeping she is utterly worthless, and if he wants his shirt washed, or his cow milked, or his butter churned, or his cheese made, he must hire some person to do it.

* Let none of your readers suppose, from these remarks, that I am indifferent to school education. I hold that "for the soul to be without knowledge is not good;" that the mind cannot be too well furnished with substantial and useful information, that, if it were possible, with a due regard to other interests, it would be well for the female mind to embrace the entire circle of all the sciences; but I hold that there are interests, involving duties to ourselves, to our country, and to our God, which must be neglected if mere mental cultivation be carried too far.

The other error to which I referred above, is the neglect of school education altogether, or nearly so, which prevails to a great and lamentable extent. Both these errors should, if possible, be avoided. The following considerations seem to recommend themselves to the common sense of all who think seriously on the subject:—

1st. Education should be so conducted as to preserve, in their full vigor, the physical energies, and not to impair the health of the pupil.

2nd. School education should not be allowed to interfere with the urgent claims of humanity.

3rd. Education should be so conducted as not to foster habits of indolence.

4th. School education should not be allowed to clash with the claims of justice and honesty.

5th. School education should be so conducted as to cultivate the moral and religious feelings in conjunction with the mental faculties.

First, then, we hold that health should not, on any account, be sacrificed to mere mental cultivation. We often read of young men who "Over books consume the midnight oil" till their bodily energies lie prostrate on the altar of ambition, and health is murdered by devotion to study. Now, with all due respect for education, we think such learning bought too dear. No earthly good can compensate the loss of health. No amount of prosperity, no increase of wealth, no extent of mental cultivation, can possibly repay the loss of health; and it is a fact to be deplored, that, generally speaking, those young females who have had what is called "a good bringing up," who have been "nursed on the downy lap of ease," have had but little exercise, and have devoted most of their time to study, are slender in constitution, delicate in health, and unable to endure fatigue:—while other young females, less favorably circumstanced, who have been obliged to

assist their parents to earn a subsistence, who have had much exercise and but little learning, are robust in constitution and blessed with good health. These considerations suggest the following thoughts:—

1st. School-houses should be roomy and well ventilated.

2nd. Girls should be encouraged to play and romp in the open air, during intermissions and at noon.

3rd. The further girls have to walk to and from school, in reason, the better.

4th. Mothers should see that their daughters take sufficient exercise in domestic employments, both before and after school.

AN OLD FARMER.

Yarmouth, Feb. 15, 1854.

To be continued.

BLIGHT, MILDEW, AND RUST IN GRAIN.

For the *Agriculturist*.

Blight according to our ideas, originates from moist foggy weather, and hoar frost. The effect of which when expelled by a hot sun, are first discernible on the straw, afterwards on the ear, in a greater or lesser degree according to local circumstances. Let a field be examined in a day or two after such weather, and a careful observer will soon be satisfied in consequence of what may be called a stoppage of perspiration. This disorder may take place either earlier or later but is most fatal when it appears at an earlier state, and though the productive powers of the plant will thereby be lessened, yet if circumstances are afterwards favourable, the quality of the grain produced may not be much impaired, or it may appear after the grain is fully formed and very little damage except to the straw shall then be sustained, Mildew, again, strictly speaking, may be ranked as a disease which affects the ear, and may be brought on by causes somewhat similar to those which occasion blight, though at a more advanced period of the season; if this disorder come on inmediately after the first appearance of the ear the straw will also be affected, but if the grain is nearly fully formed, the injury on the straw is not much discernible.

Another disorder which affects wheat, and by several farmers denominated the real rust, is brought on by excessive heat, which occasions the plant to suffer from a privation of nourishment, and become sickly and feeble. In this atrophical state a kind of dust gathers on the stalk and leaves, which increases with the disease till the plant is in a great measure worn out and exhausted. The only remedy in this case, and it is one that cannot easily be administered by the hand of man, is a plentiful supply of moisture.

All these different disorders are generally accompanied by insects although not the cause of the disease.

Thin chaffed wheats are thought the only preventive of mildew.

B.

SAVING ROOTS IN WINTER, CLEANING SEED-GRAIN, &c.

To the Editor of the *Agriculturist* :

Sir,—A portion of live-stock feeding, every winter, being now a branch of revenue which is being increased every season, and pretty generally adopted among farmers in this country, the best method of keeping a large quantity of turnips for that purpose in a sound condition, is a piece of information which I believe would be acceptable to all interested; and while I will not presume to say that I have lighted upon the very best means which could be devised for the purpose, yet, in the absence of more interesting matter, perhaps you may not consider the following remarks unworthy of a place in the *Agriculturist*.

In November '52, I constructed a root-house adjoining a feeding house, on the following plan and dimensions: excavated a pit 6 feet deep, 10 feet wide, and 28 feet long,—dug a drain all round the side, at the bottom of the wall, 2 feet deep and 16 inches wide,—placed cedar posts, cut to equal lengths, in the bottom of the drain, 3 feet apart, from centre to centre, keeping the posts in a straight line about two inches apart from the wall,—filled up the drain with gravel, packing it firmly in about the foot of the posts, put in inch boards all round outside of posts, and filled the inch space between the boards and the wall with gravel. By adopting this method you will see at a glance that the water which will ooze in at the side, in wet weather, would pass through the sand outside of the boards into the gravel drain in which the posts are placed, which again communicates with the drain provided for taking the whole water off. In roofing in I used 4-inch scantling for rafters, putting a collar-beam of equal height on each rafter,—sheeted the inside of the rafters and under the collar-beams with inch lumber, and, before putting on outside sheeting for to shingle on, filled the vacant space of four inches, between the inside and outside sheetings, with tanners bark. This formed a dry, frost-proof house, which holds 44 wagon loads of turnips at the expense of £3 5s 9d for materials, including the charge for excavating. So far so well, but a terrible evil still awaited my scheme. Although an aperture at each end and one through the centre of the roof had been left for ventilation, a heat, shortly after being housed, sprang up among my turnips, which an outside temperature below zero had no effect in cooling, and, in the course of the winter, all were less or more injured by sprouting, and many were lost by decomposing. With a view of removing this evil, and on the approach of this last winter I made a box spout of inch boards, 9 inches broad, to extend the entire length of the root-house,—bored inch and a quarter holes about six inches apart, on each of the four sides of the box,—first put in about two feet of turnips, then placed the spout on the top in the middle in a horizontal position, with an upright box spout from the centre by way of a chimney through the roof,—and then filled the house brim full. I am glad to say this method proved effectual; at no time throughout the winter was heat perceptible among the turnips—none of them sprouted, and not so much as one

decomposed. In carrying out this principle of central ventilation I believe, with deference, any quantity of turnips which could be put together in the largest space would keep safe and sound. It may, however, be proper to remark that the upright funnel should be taken out at the end of some four or five weeks and the aperture in the roof which it passed through made frost tight, also, the horizontal spout should be cut in short convenient lengths so that they may be taken out and laid aside as the consumption of the turnips progresses.

I would next respectfully take leave to direct your attention to a recent invention whereby oats, &c., can be effectually extracted from spring wheat, and as the sowing time is approaching perhaps it would be useful to many farmers whose seed is far from clean. Having had the information kindly conveyed last fall to me, by an American gentleman, that a fanning mill was exhibited at the last year's New York State Agricultural Fair, which so thoroughly separated oats from wheat that the exhibitor amused crowds of people by mixing the grain, half oats half wheat, and by once fanning again entirely separated the respective grains. But I regret to say, beyond the fact of this cleaning operation being effected by a tin plate struck full of small holes fastened on a frame to fit the fanning mill, I am not informed. However, I set to work the other week and groped my way to the following very simple and effective method. I made a screen frame to fit the groove in which the smut board is placed, procured a sheet of tin sufficiently large as to fit on the frame,—struck it full of round holes with a steel punch of uniform size, each hole permitting a grain of wheat to drop through lengthways, then tacked the tin to the frame, and having tested the experiment, I have pleasure in saying the success was complete: while the wheat dropped through the holes in the plate, the oats, white caps, &c., glided over the surface. Care, however, must be taken to have the tin surface smooth, to be fitted tight to the frame, with no hollow in the middle, with a strip of wood on each side of the frame so as to guide the grain off it, with the least possible shake on the fanning mill, and to feed in proportion as the wheat drops through the tin screen. But should some of the larger grains of wheat continue to drop over the end of the screen with the oats, it only costs the trouble of putting it through the mill a second time. Again, should any farmer desire to present an unrivalled sample of peas or wheat at show or market, he has only to substitute for the low chess screen a tin plate with holes of the size to keep back the plumpest grain, and he will find the experiment work well.

There are still some small matters connected with farming operations to which I intended respectfully to have drawn your attention, but having already swelled my remarks beyond what I intended, and believing that your patience must be *threadbare* with what I have already written, shall reserve them until some future time.

I am, sir, your obedient servant,

WILLIAM GORDON.

Whitby, March 3, 1854.

ON GROWING PEAS, &c.

To the Editor of the *Agriculturist*.

DEAR SIR.—It was my intention to have sent you this paper some time ago, but I was prevented by that inveterate enemy of the farmer and thief of time *Procrastination*; but as I have at length proved victorious, I beg leave to send you my method of growing Peas, should you deem it worthy of a place in your valuable publication. I mentioned to you in a former paper that my land is clay. As far as I can form an opinion from the slovenly and negligent manner in which peas are cultivated in this neighbourhood, from sheer want of emulation and passive negligence, I do not wonder that the universal cry is, Peas wont pay; whereas, when grown in a judicious manner there is perhaps no crop cultivated that will leave more remuneration for the labour and expense bestowed, even if they did not prepare the land in a superior manner for a wheat crop. You are aware, that Farmers in Canada are much annoyed or rather injured by the *Pea Bug*; now to prevent injury from that pest, as a strict rule I never sow before the 12th of June, but as soon as possible after that date, but such late sowing will not suit late or long-strawed varieties, I therefore sow an early dwarf. My manner of preparing the land for peas is this: if it is turf where Timothy has grown, I plough in autumn, harrow well about the middle of April, let it lie till the first week in June, rib it across and sow after the 12th, harrow lengthways as it has been ploughed, if it is intended for fall wheat, I manure it according to the condition the land is in before I rib it, because I invariably find my wheat give a better return when the manure is applied to the previous crop; again if it is clover, I never plough in the fall, but let my Ewes have the benefit of it a month in lambing time, which gives the lambs a start they never forget all summer, turn them out a month before I intend to plough, and about the 7th of June, I plough down the Clover, which if the land is in tolerable condition may be about a foot high, I turn the furrow pretty well over, let it lie till the 12th, sow and harrow with the furrows, never across. My average crops since I adopted this plan has been over thirty bushels per acre, and of the best quality,—without a single bug; they come off the ground in good time for fall wheat,—and such wheat does always better with me than from naked fallow.

LIVE FENCES.

It is with pleasure I see the subject of live fences brought before the public. I laid out my garden a number of years ago, but could not determine what kind of fence to enclose it with, I had often been struck with the beauty of the native White Thorn; so I at last resolved three years last spring to try them. I accordingly desired my boy when he went to the woods for the cattle, to collect young thorns half an inch in diameter, cut them off and bring the roots home, he soon succeeded in getting enough to fence it round about 14 rods, and I am highly gratified to say, if it continues to grow as it has done for three or four years, I am not the least afraid that

with very little care it will defy the efforts of the most determined depredator of the Swinish multitude to break through it, as well as all other kinds of farm stock; it has the advantage of being cheap and can be got with very little trouble.

VERMIN ON SHEEP.

There is, perhaps, nothing that I have either seen or tried myself attended with so beneficial results in Canada as common whale oil, it effectually destroys the vermin, and at the same time helps the growth of wool, and may be applied at all seasons without any risk. I have enclosed for your consideration an advertisement cut from an old country paper, the *Kelso Chronicle*, which I think would come very properly under the notice of the Board of Agriculture; what an immense benefit it would be in this country where sheep are tormented with flies and vermin of every description. By several letters from many of my old friends they bear witness to the testimony set forth in that advertisement; were the Board of Agriculture to authorize some person to import a quantity of Wilson's Preparation, I have no doubt whatever it would be highly valued by the enterprising flock-masters in Canada. With a desire to benefit those who may read,

Your most obedient servant,

THOMAS STEPHENSON.

Oakland Farm, Warwick.

ON AGRICULTURAL CORRESPONDENCE, &c.

To the Editor of the *Agriculturist*.

SIR,—It is truly said that farmers have no secrets, and that they cheerfully communicate all they know to any enquirer. Whence then the unwillingness of so many of your readers to contribute to your Magazine. I imagine that Government in encouraging Agriculture, has in view the dissemination of a useful information; this could be effected by the County Societies forming a Committee of Correspondence in each, who should contribute at least twice yearly to the *Agriculturist* on subjects interesting to Agriculture, distinct from Farmers' Clubs and Lectures. When I referred to Scobie's Almanac, I counted upwards of 360 Townships, and asked if one correspondent could not be found in each. Perhaps, however, the County Societies alone would supply sufficient useful information which could be arranged in something like the following order:

- | | |
|-------------------|-------------------------------------|
| Brant, | } County Societies to contribute in |
| Carleton, | |
| Essex, | |
| January and July. | |
| Lambton, | } In February and August, |
| Frontenac, | |
| Lenox, | |

and so on with the other Counties. There being upwards of forty counties, three or four communications would be received monthly, which might be sufficient, with other occasional original letters, for publication. Only set this in motion, a vast deal of information that is now locked up would

be circulated, and a well related anecdote now and then enliven our Bushmen. I remember once reading in the old *Farmer's Journal*, that a farmer in Wiltshire had ten sheep go astray, and he desired the Parish clerk to give notice of his loss in church, which was done as follows: "Mr. —, has lost ten sheep, five are Nott sheep and five are not Nott sheep." In Wiltshire, the horned and hornless sheep are called Notts and Polls.

It may be deemed presumptuous in a labourer to address you, I hope, however, that in future my betters will shoulder me out, my poverty of language hardly enables me to express my thoughts intelligibly, for like the soldier officer, who when he was appealed to concerning books, replied, "Pon honor never read but two books in my life, the Bible and the Articles of War," so with me my reading has been very limited.

Mr. Hind in his Lecture on Agricultural Chemistry, recommends salt to be mixed with plaster for land, but he gives no authority for our guidance. In a lecture too, published last year in the *Agriculturist* the same is suggested, but the result of no experiment is given. In the old country, I know only of two trials of salt to land, one decidedly improved the straw and grain, and the other the straw only. It has been constantly dinned into the farmer's ear, that with a little extra pains the crops could be made to produce four and five bushels per acre more than is now done. This is to me sickening, since but for the rust it could be more than done on many farms. With me the question is, cannot a preventive against the rust be found in salt—if bright straw could be grown one might be certain of having good wheat. What I have read of salt also, has tended to confirm my opinion that it would. Unluckily for me I must leave this for my betters to decide.

In England it is said that 40 bushels per acre would make the land unproductive for many years; in Canada, the quantity I have known applied to a bed of thistles without injury to the following crop of grain would appear fabulous were I to state it, and it has led me to think that there is a vast difference in the qualities of Onondaga and European salt, or that it is a vulgar error to suppose that a large quantity per acre would act as a poison. I know that manganese, or lime if applied in a quantity exceeding sixty bushels would do it. That salt suits mangel wurzel I have the authority of a Farmers' Club in England. At a meeting of the Petworth Club, a Mr. Boxall stated that having some farm students he encouraged them to experiment,—that on a field intended for mangel wurzel, part of it was dunged and part salted, and that the crop from the latter averaged the weight per acre grown on the former.

In the new testament we read "if the salt lose its savor." Now, I always understood salt to be indestructible. I will thank you to interpret the above.

I will thank some correspondent for a remedy for the distemper in swine.

A LABOURER.

SCRAGG'S TILE MACHINE.

To G. BUCKLAND, Esq., *Professor of Agriculture, Secretary of the Board of Agriculture, &c.*

MY DEAR SIR,—You are already aware, that I was authorized last fall to make a short tour of examination in the neighbouring State, and elsewhere in the Union if I should think expedient, for the purpose of reporting to the Minister of Agriculture any facts that might be deemed worthy of his notice, with a view to action by him, through the Bureau or Boards of Agriculture, for the advancement of our agricultural interests. The result of my mission, which occupied but a few days, was a brief report, communicated to the Minister of Agriculture, and not yet printed. There is one subject—a Drain Tile Machine—to which I have called the attention of the Minister, which your Board has also had under consideration. As some of my enquiries were made at your suggestion, it may not be unserviceable to extract a few passages from my Report for the information of yourself and the members of your Board. I hope Mr. Charnock, the gentleman who has established himself at Hamilton, and who purposes to manufacture Tile Machines of a superior kind, will be successful; but it may nevertheless be proper that the Board should ascertain the price, character, and capabilities of the machines now in operation in the adjoining State, before granting public aid or entering into permanent arrangements. A good Tile Machine *in operation* is a desideratum in this part of the Province, and one which I fear will not be supplied, for some time at least, without direct public encouragement. When the demand for drain tiles shall become more urgent, from a stronger and more general conviction of their utility, the manufacture will be undertaken without other stimulus than the ordinary one of certain profit.

By submitting the facts mentioned in the extract herewith, to the Board of Agriculture at its next meeting, you will much oblige,

Your obedient servant,

WM. McDOUGALL.

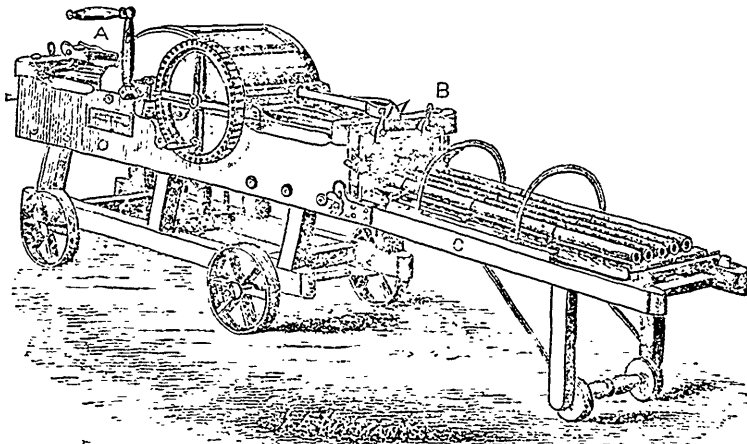
Toronto, March 17th, 1854.

Extract from Report to Hon. J. Rolph, Minister of Agriculture, &c.

"The U. C. Board of Agriculture, as you are aware, have already had the subject of Drain Tile manufacture under consideration, and have offered a premium to the person who shall first put in successful operation in U. Canada a good Tile Machine. At the suggestion of Professor Buckland, Secretary of

the Board, I called upon J. Delafield, Esq., of Geneva, N. Y., the gentleman who introduced the first efficient Tile Machine into that State, and obtained from him much useful information on that and other subjects. Mr. Delafield (since dead) is President of the Agricultural College recently chartered by the N. Y. State Legislature, which is about to commence its operation under most favourable auspices. In 1848 Mr. D. imported from England at his own expense one of Scragg's Tile Machines, and placed it in the hands of a Potter near Geneva, upon such terms as induced him to undertake the manufacture of Drain Tiles at reasonable cost. Mr. D. himself became a customer for a large quantity and thus set an example to his neighbors. I saw this machine in operation and was informed by the proprietor that although attempts had been made to copy and improve it, yet he preferred the imported machine, and had ordered a new one to be constructed exactly like it. The machine costs about £50, is very simple in its construction, and not liable to get out of order.

The clay is the same as that ordinarily used by common potters, and is prepared by a Pug Mill in the usual way. It is then put into the machine and by the motion of a crank (turned by one man) is forced through moulds which give the desired shape to the tiles. With ordinary attendance about 3000 two inch pipe tiles are turned out daily. The machine is capable of producing a much larger quantity, but 3000 is the limit as it is now worked. I visited a Tile factory at Albany, in which a machine constructed on a different plan (also imported from England) is used. But judging from the appearance of the Tiles, and from the opinions of several gentlemen who have taken much interest in the subject, I believe the machine at Waterloo (near Geneva) is to be preferred. Professor Wilson gave me the names of the principal machines now used in England, and he mentions Scragg's as one of the best. I procured a cut of this machine which will better enable you to judge of its simplicity, &c.



SCRAGG'S TILE MACHINE.

The clay is put into the machine at *a*. After passing through a set of screens which remove all the small stones and gravel, it is subjected to the action of rollers so as to give it a due consistence. It is then forced through the dies at *b*, and along the receiving table *c*, which is composed of canvass placed over rollers so as to move with the tiles. The semi-circular wires descend at the proper moment and cut the tiles to a uniform length. They are then carefully removed to drying shelves until ready for the kiln. Mr. Wartenbury, the manufacturer, informed me that the burning process was not more difficult than in the case of common pottery, but that some experience was necessary to prevent a large per centage of loss.

Before the introduction of this machine Drain Tiles cost Mr. Deafield and others in Seneca county from \$20 to \$25 per thousand. They are now produced for \$9 per thousand. I obtained the following particulars of the expense of under-draining in the neighbourhood of Geneva, both before and after the introduction of the Tile Machine.

Before the Tile Machine was put in operation the cost of thorough draining per acre, with drains 33 feet apart, which would require 91 rods of drain, was

stated by Mr. Delafield in an elaborate report to the State Agricultural Society, as follows:—

Tile, small size, 20 cents per rod, \$18.20
Cutting trench, laying, &c., 18c, " " " " 16.38

Cost per acre, \$34.58
Or, 38 cents per rod.

The cost of making a common stone drain, the stone being on the field to be drained, he stated as follows:—

Man and team per day, hauling enough
for about 5 rods, \$1.50
Cost of laying at 6c. per rod, 30
Cost of trench, &c., 18c. do..... 90

Cost of 5 rods stone drain, \$2.70

Or, 54 cents per rod, showing a difference of 16 cents per rod in favor of the tiles, even when manufactured by hand. An acre with drains 33ft. apart requires about 1320 twelve inch (in length) tiles. The present cost, Mr. Delafield informed me, is about 20 cents per rod, the tiles costing \$9 per thousand at the manufactory."

Agriculture, &c.

THE EXHAUSTIVE SYSTEM.

The following remarks of an American writer, upon the wasteful system of cultivation so generally prevalent in the older states of the Union, will apply with equal force to many parts of Canada:—

“Young men, observing the exhaustive effects of imperfect tillage, suppose that the agricultural profession, instead of being an open field for the efforts of science to improve, is but an arena fit only to be occupied by the illiterate, under the guidance of tradition. So they press in masses into other callings, leaving the old homesteads with disgust.

“We are also told that the same process of deterioration, which has been so nearly completed in the Atlantic States, is going on at the West. Although nature by a long and most liberal process has endowed the lands of that section with a fertility elsewhere unknown, still they can be impoverished by the hand of man. The gradation to the same climax which has obtained in the older States may be slower, yet, in the nature of things, it must be sure. Many of the occupants of those now generous soils, under the same mistaken impression that they are inexhaustible, which possessed the first settlers of the more fertile tracts of the Eastern States, will probably live long enough to find that, under a constantly depleting and careless husbandry, what has been done can be done again. These remarks are of course subject to exceptions; but they are still quite too generally true.

“While this rapid destruction of fertility has been going on among us, several of the States of Europe have been as rapidly advancing in productiveness. There agriculture is fostered and encouraged by Government; men of the first attainments, and in the highest walks of life, devote their time and talents to its improvement; the light of several sciences has been shed upon it; lands have been so changed within seventy years past by a judicious rotation of crops, and a system of manuring adapted to the soil and the crop, as to increase threefold in productiveness; thousands of acres of wet lands, hitherto of little or no value, have been drained, and are now under profitable cultivation; agricultural schools and colleges have been established; and the breeding of agricultural animals has been carried to so high perfection in England and Scotland, that any other breeds in the known world, may be improved by a cross with them.

“It may be said that such high cultivation cannot be profitable here. Neither can we afford to pursue our exhausting system of cultivation much further; for the decreased and decreasing crops will not remunerate our labour. If the state of things in our country will not warrant high farming, to the extent to which it is now carried in the countries spoken of, we certainly are warranted in the employment of far more enlightened and correct principles of tillage than are now common.—*New England Cultivator.*”

FARM-YARD MANURE—ITS MANAGEMENT AND APPLICATION.

BY A PRACTICAL FARMER.

“Where there's muck there's money”

The old adage quoted above is certainly a true one as applied to Agriculture. “Muck is the mother of money,” is another homely maxim; and these are verified by the experience of every good farmer; good muck produces great crops; great crops produce much manure; and such manure will produce more crops and in greater variety; and so improvement goes on indefinitely. It is with the view of urging closer attention to the making, preservation, and application of farm yard manure that I now make a few suggestions.

The Fold Yards.—These should be surrounded by the farm-buildings, or, if open on any side, they ought to be on the south. The bottoms should be close and compact, so as to prevent sub-soil absorption of the liquid manure, and in form somewhat concave or “dishing.” The buildings must all be spouted to carry off surplus rains, otherwise the yards form cisterns for them to drain into. The more shed or hovel covering the yard possesses the better, as the manure is always most valuable where made under cover. To cover every farm-yard is impracticable, but much might be said in favor of such an uncommon innovation upon old wedded customs.

The Making or Manufacturing of Manure.—The design and aim should be to make as much as possible from every kind of product of the farm, and to make it good. For this purpose every article of vegetable matter that can be collected from the farm should be brought to the fold yard to be there converted into manure—nothing burnt, nothing wasted; even the very twitch itself forms a profitable foundation for the yard accumulations; all ditch-roavings, hedge-trimmings, road-scrappings, straw matters, all sorts, must come to the fold-yard. The harvesting of every crop ought in some measure to be guided by the requirements of the fold-yard. A corn crop mown and stacked in its usual undiminished state will produce much more manure than if reaped, and the stubble left for an unlimited period to rot and decay; it begins to lose bulk the moment it is cut.

To Make it Good.—The straw should be very carefully and with great regularity given to the yard stock, and in its consumption should invariably be with a liberal allowance of corn, cake, turnips, and other roots the more stock and the more artificial food they consume, the better for the manure. Other aids may be applied to enrich the heaping mass—such as night soil, town sewage and the like; sea-weed; fish of various sorts (particularly shell fish): the latter not only enriches the manure, but provides a small supply of calcareous matter for soils requiring it.

Its Preservation.—This growing mass should be left undisturbed (except its daily but partial stirring by the stock of pigs in search of the stray grains or the refuse turnips of the cattle) till near the time when it is required for use. About

a month or six weeks before it is used it should be all turned over very systematically in layers about four feet wide, and in small, well separated fork-furrows; the whole surface or top to be carefully levelled to prevent undue exhalation of its ammoniacal particles. In about six weeks the amalgamated mass will be in the best possible state for application to the soil, *i. e.*, it will be in its richest, most unctuous state of semi-decay, yielding ammonia for the soil to promote fermentation, and a highly nutritious supply of food for the crop to be grown. It is, however, in many cases absolutely necessary to lead considerable quantities of the fold-yard manure to the distant fields of the farm in the winter season, to be in readiness for the turnip sowing, or other purposes. This is attended with much waste of manure; but, to make the best of it, these heaps should always be made by the carts being drawn upon them to deposit the manure, and to compress them as closely as possible to prevent exhalation. In order to fix the ammonia in these heaps, they should always be sown profusely with gypsum as the leaching proceeds; if this cannot readily be procured, a similar application of soot will answer nearly as well. As soon as a heap is finished, it should be rounded up and slightly covered with soil almost immediately.

Its Application.—The most judicious and profitable application of farm-yard manure is to promote the production of root crops and pulse crops. It is comparatively inapplicable to the production of a corn crop on most soils, but on every soil it aids surprisingly the progress of both root and pulse crops. As a top-dressing for grass seeds or clovers it is very serviceable; but its chief value is obtained when applied to produce a root crop. A good root crop is the foundation of good husbandry—the forerunner of every other crop; it is the substance of good farming. A good root crop, *i. e.*, turnips, mangold wurzel, coleseed, or the like crop, produces much food; this produces much manure; and, not only undiminished but enhanced fertility is the result.—Potatoes are extensively grown, and are a profitable root crop, but when sold from the farm are certainly an exhausting crop; but if consumed thereon, the produce is returned for the most part to the soil in the manure, minus the pork; and, like other roots, they return as minus the mutton and beef, and also the carbonic acid gas emitted by the stock in consumption. The pulse crops are much benefited by dressings of farm-yard manure; and being tap-rooted they draw much of their food from the subsoil, and leave a considerable proportion of the dressing for the succeeding crop. I would here observe that it should invariably be applied to the soil in the richest state of semi-decay to which it can be brought, and it ought to be ploughed in at the time of application.

To the Root Crop.—Every root crop ought to have a well-pulverized and prepared soil—the finer the tith the better chance for the early progress of the seeds. The mangold wurzel, the Swedish turnip, the coleseed; to which I may add, the varieties of the cabbage crops, should be put in upon the ridge system—the ridges to

be from twenty-four to twenty-seven inches apart. This is the very best mode of applying farm-yard manure; the deposit of the manure and the ploughing in may go on so simultaneously that none need be exposed to atmospheric influences beyond the hour; and rolling the ridges should take place immediately. Thus every portion is covered; it is thoroughly compressed into the mouldy soil precisely under the line for the deposit of seed, and, like a hot-bed it quickly produces vegetation; the plants soon strike their roots into the line of manure beneath and are at once out of danger and rapidly flourish. The varieties of common turnip, carrot, potatoes, &c., are best put in “on the flat.” In manuring for these crops the greatest care should be taken to plough in the manure as speedily as possible after it is laid on the land and spread; and it should further be put at the bottom of every furrow as the ploughing proceeds, by lads following the ploughman. Rolling to be done as for ridges, and be drilled or set without harrowing. For grass seeds or clovers the manuring may take place at any convenient and suitable time during the winter, and ought to be well brushed in immediately. If applied to the production of corn crops, I can only say the sooner it is ploughed in the better.

Quantity.—This must depend upon the fertility of the soil, and the supply of manure on hand. To produce first-rate crops, the mangold wurzel, the Swedish turnip, the potatoe, the carrot, and the cabbage crops will require from 15 to 18 good two-horse cart loads per acre; the coleseed and the common turnip crops will require from 10 to 14 such loads; the grass seeds or clovers from 8 to 10 loads; and the corn crops from 8 to 12 loads.

The exposure which farm-yard manure is subjected to in many districts, both in the field and in the heap cannot be too strongly deprecated: it is thus often rendered valueless—not a whit better than rotten stubble, nor worth the cost of laying on the field. In such management, and for such managers, we may reverse our motto, and say—Where there is no muck there is no money.—*Mark Lane Express,*

SHELTERING MANURE.—Stable manure kept under shelter, and properly mixed with absorbing substances, muck leaves, straw litter, &c., is of much greater value than when exposed in the open yard. An analyses made at the English Agricultural College, shows that it contains more than double the quantity of nitrogenized matter, and the same of salts containing organic and inorganic matter, soluble in water; while of potash and soda, the unsheltered manure retains only .08 per cent., and the sheltered two per cent.

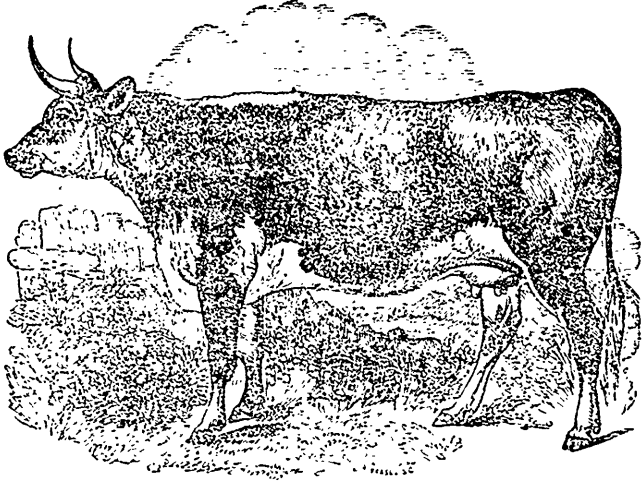
STABLE STOCK.—An exchange says, when farm stock is kept in well littered stalls, and every other judicious means taken to manufacture manure, one head will produce sufficient to keep an acre of ground in the highest state of fertility. We know this from experience.

Natural History.

THE OX.—HISTORY, MANAGEMENT, &c.

We have published about fifty pages of Mr. Youatt's excellent and standard work on cattle and shall continue our extracts during the remainder of the volume. No better or more reliable information as to the origin, character,

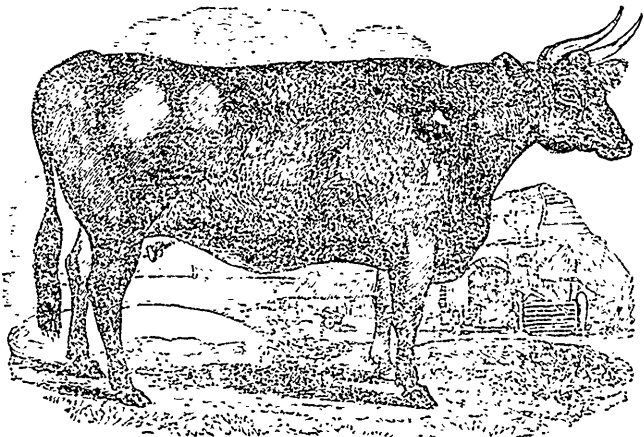
and merits of the different breeds of cattle could be presented to our readers. The subject, moreover is one with which every farmer ought to be familiar, and we trust that our efforts to make it so will not prove unacceptable. We have procured from New York the principal cuts employed to illustrate the original work, and give below those which ought to have appeared in the March number.



HEREFORD COW.

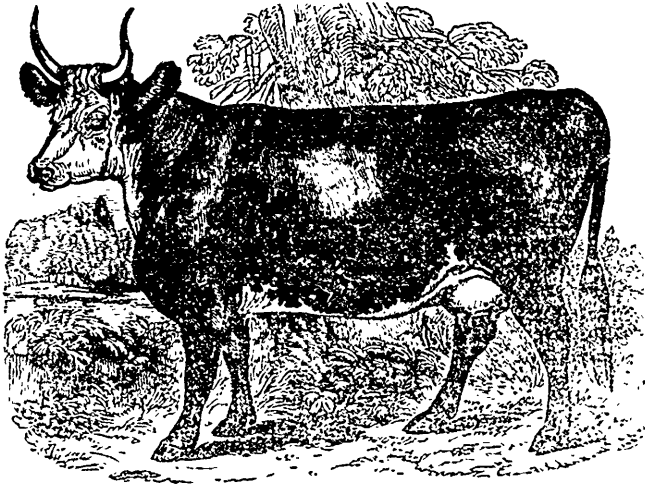
The above cut should have been given on page 81, where the reader will find everything of importance in the history of this admirable breed. We have often wondered that the Here-

fords have not been more generally introduced into Canada. Our correspondent, W. H. Sotham, has frequently brought them under the notice of our readers.



THE SUSSEX COW.

The above should have appeared on page 82, of last number.



GLAMORGAN COW.

If the reader will turn to page 83, he will find the Glamorgans fully described.

THE MIDDLE HORNS.

(Continued from last number.)

SCOTLAND.

Scotland contains several distinct and valuable breeds of cattle, evidently belonging to our present division, "The Middle Horns."

The West Highlanders, whether we regard those that are found in the Hebrides, or in the county of Argyle, seem to retain most of the aboriginal character. They have remained unchanged, or improved only by selection, for many generations; indeed from the earliest accounts we possess of Scottish cattle.

The North Highlanders are a smaller, coarser, and in every way inferior race, and owe the greater part of what is valuable about them to crosses from the Western breed.

The North-Eastern Cattle were derived from, and bear a strong resemblance to, the West Highlander, but are of considerably larger size.

The Ayrshire breed are second to none as milkers.

The Galloways, which scarcely a century ago were middle-horned, and with difficulty distinguished from the West Highlanders, are now a polled breed—increased in size, with more striking resemblance to their kindred, the Devons—with all their aptitude to fatten, and with great hardness of constitution.

THE WEST HIGHLAND CATTLE.

The cattle on the islands on the Western coast have the honor of being, or, at least, of retaining the character of the primitive breed, and whence are procured the purest and best specimens to preserve or to improve the Highland cattle in other districts.

Skirting the coast from the promontory of Cantire to the northern extremity of Scotland, is a range of islands—the Hebrides, about half of them inhabited by man.

Little is known of the history of the Hebrideans except that they descended from the same stock

with the Irish and Highlanders; and, at no very remote period, the inhabitants were singularly uncultivated, ignorant, idle, and miserable.

After the union between the English and Scottish kingdoms, and when civilization had commenced on the mainland, the Hebrideans began to be reclaimed, and that was chiefly manifested in, and promoted by, a change of occupation. Although they did not abandon their seafaring life, they began to be agriculturists. Their cattle, which had been totally neglected, and their value altogether unknown, retained their primitive character. The Hebrideans for the first time became aware of this, and they bred them in great numbers, and a few of the most intelligent farmers endeavored to improve them by selections from the best specimens of their native stock; the result has been, that the breeds of some of these islands now bear the highest price among the Highland cattle.

In a group of islands, extending nearly two hundred miles from north to south, there will be considerable difference in the character and value of the breed; but through the whole of them the striking peculiarities of the Highland cattle are evident. The principal difference is in the size, and in that the cattle of the southern most island, Islay, claim the superiority. This island is sheltered by its situation from the storms to which most of the others are exposed, and the pasturage is better; the cattle are earlier ready for market, and attain a greater weight. This increase of size would not be of advantage on the northern islands, or even on the mainland—the cattle, deprived of a portion of their hardihood, would not be proof against the inclemency of the weather, and would starve on such scanty forage as the Highlands in general supply. Breeders are so much aware of this, that they endeavor to preserve and improve the value of the pasture is kept as much as possible in eatable condition, that is, neither eaten too bare, nor allowed to get too rank, or to run into seed.

their stock, by selecting, not from the districts where the size has increased, but, by almost general consent from the Isle of Skye, where the cattle are small, but are suited to the soil and climate; and can be most easily and securely raised at the least expense; and, when removed to better provender, will thrive with a rapidity almost incredible.

The origin of the term *Kyloe* is obscure, but is said to be a corruption of the Gaelic word which signifies *highland*, and is pronounced as if spelt *Kael*.

The Highland bull, or *kyloe*, should be black, or pale red, the head small, the ears thin, the muzzle fine and rather turned up. He should be broad in the face, the eyes prominent and the countenance calm and placid. The horns should taper finely to a point; and, neither drooping too much, nor rising too high, should be of a waxy color, and widely set on at the root. The neck should be fine, particularly where it joins the head, and rising with a gentle curve from the shoulder. The breast wide, and projecting well before the legs. The shoulders broad at the top, and the chine so full as to leave but little hollow behind them. The girth behind the shoulder deep; and the back, straight, wide, and flat; the ribs broad, the space between them and the hips small; the belly not sinking low in the middle; yet, on the whole, not forming a round or barrel like carcass. The thigh tapering to the hock-joint; the bones larger in proportion to the size than in the breeds of the southern districts. The tail set on a level with the back — The legs short and straight. The whole carcass covered with a thick, long coat of hair, and plenty of hair also about the face and horns, and that hair not curly.

The value of the West Highland cattle consists in their being hardy and easily fed; in that they will live and sometimes thrive, on the coarsest pastures; that they will frequently gain from a fourth to a third of their original weight in six month's feeding; that the proportion of offal is not greater than in the most improved larger breeds; that they will lay their flesh and fat equably on the best parts; and that, when fat, the beef is close and fine in the grain, highly flavored, and so well mixed or marbled, that it commands a superior price in every market.

Forty years ago, the treatment of cattle was, with very few exceptions, absurd and ruinous, to a strange degree, through the whole of the Hebrides. With the exception of the milch cows, but not even of the calves, they were all wintered in the field; if they were scantily fed with hay, it was coarse, and withered, and half rotten: or if they got a little straw, they were thought to be well taken care of. The majority got little more than sea-weed, heather, and rushes. One-fifth of the cattle, on an average, used to perish every winter from starvation. When the cold had been unusually severe, and the snow had lain long on the ground, one half of the stock has been lost, and the remainder have been thinned by the diseases which poverty had engendered.

It proved the excellency of the breed, that in the course of two or three months, so many of

them got again into good store condition, and might almost be said to be half-fat, and could scarcely be restrained by any fence; in fact there are numerous instances of these cattle, which had been reduced to the most dreadful state of impoverishment, becoming fattened for the butcher in a few months after being placed on some of the rich summer-pastures of Islay, Lewis or Skye.

The cows were housed during the winter; the litter was never removed from them, but fresh layers of straw were occasionally laid down, and so the floor rose with the accumulation of dung and litter, until the season of spreading it upon the land, when it was taken away.

The peculiarity of the climate, and the want of inclosed lands, and the want, too, of forethought in the farmer, were the chief causes of this wretched system of winter starvation. The rapidity of vegetation in the latter part of the spring is astonishing in these islands. A good pasture can scarcely be left a fortnight without growing high and rank; and even the unenclosed and marshy and heathy grounds, are comparatively luxuriant. In consequence of this, the farmer fully stocked, or over-stocked, even this pasture. He crowded his fields at the rate of six or eight beasts, and even more, to the acre. From their natural aptitude to fatten, they got into tolerable condition, but not such as they might have attained. Winter, however, succeeded to summer: no provision had been made for it, except for the cows; and the beasts that were not properly fed even in the summer, languished and starved in the winter.

The Hebrides, however, have partaken of that improvement in agriculture of which we shall have frequently to speak when describing the different districts of Scotland. In the island of Islay, the following is the general system of management among the better kind of farmers, and the account will apply to the Hebrides generally, and to Argyleshire.

The calves generally are dropped from the 1st of February to the middle of April. All are reared; and for three or four months are allowed to suck three times a day, but are not permitted to draw any great quantity at a time. In summer all the cattle are pastured; and the calves are sent to their dams twice a day, and the *strip-pings*, or the last part of the milk, is taken away by the dairy-maid. The calves are separated from the dams two or three weeks before the last cows are sent to the cattle-tryst at the end of October, the greater part of them being driven as far as the Lowland districts, whence they gradually find their way to the central and southern counties of England.

The calves are housed in the beginning of November, and are highly fed on hay and roots (for the raising of which the soil and climate are admirably adapted) until the month of May. — When there is plenty of keep, the breeding cows are housed in November, but in general they are kept until three or four weeks before calving. In May the whole cattle are turned out to pasture and, if it is practicable, those of different ages are kept separate; while, by shifting the cattle,

In the winter and the spring all the cattle except the breeding cows are fed in the fields; the grass of which is preserved from the 12th of August to the end of October. When these inclosures become bare, about the end of December, a little hay is taken into the field, with turnips or potatoes once or twice a day, according to the circumstances, until the middle or end of April. Few of the farmers have these tools to give them, and the feeding of the out-lying cattle with straw is quite abolished. If any of them, however, are very materially out of condition, they are fed with oats in the sheaf. At two or three, or four years old, all except the heifers retained for breeding are sent to market.

There is no variety of breeds of cattle in the Hebrides. They are pure West Highlanders. Indeed it is the belief of the Hebridean farmer that no other cattle will thrive on these islands, and that the Kyloes could not possibly be improved by being crossed with any others. He appeals to his uniform experience, and most correctly so in the Hebrides, that attempts at crossing have only destroyed the symmetry of the Kyloes, and rendered them more delicate, and less suited to the climate and pasture.

By selection from the choicest of the stock, the West Highlander has been materially improved. The Islay, the Isle of Skye, and the Argyleshire best readily obtains a considerable higher price than any other cattle reared in the Highlands of Scotland. Mr. M'Neil has been eminently successful in his attempts to improve the native breed. He has often obtained £100 for three and four-year-old bulls out of his stock; and for one bull he received £200. He never breeds from bulls less than three years, or more than ten years old; and he disapproves, and rightly in such a climate, of the system of breeding in and

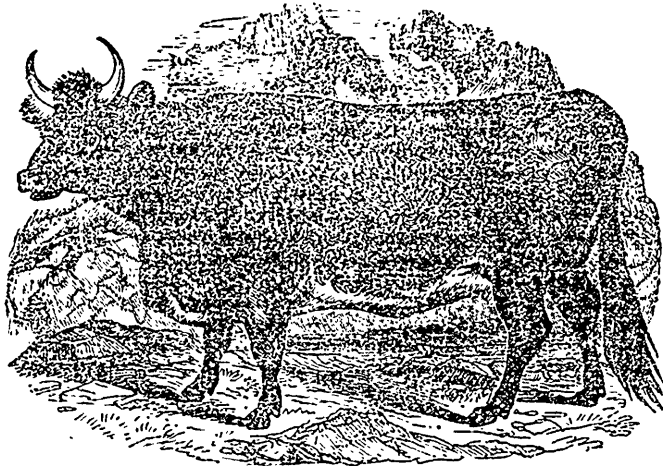
m. He also adheres to that golden rule of breeding, the careful selection of the female: and indeed it is not a small sum that would induce the Hebridean farmer to part with any of his picked cows.

It will be concluded from what we have said of the milking properties of the Kyloe, that the dairy is considered a matter of little consequence in the Hebrides; and the farmer rarely keeps more milch cows than will furnish his family with milk and butter and cheese. The Highland cow will not yield more than a third part of the milk that is obtained from the Ayrshire one at no great distance from the main land; but that milk is exceedingly rich, and the butter procured from it is excellent.

Oxen are never used for the plough, or on the road, on any of the Hebrides.

We have stated that more than 20,000 of the Hebridean cattle are conveyed to the main-land, some of which find their way even to the southernmost counties of England; but, like the other Highland cattle, their journey is usually slow and interrupted. Their first resting-place is not a great way from the coast, for they are frequently wintered on the coarse pastures of Dumbartonshire; and in the next summer, after grazing awhile on the lower grounds, they are driven farther south, where they are fed during the second winter on turnips and hay. In April they are in good condition, and prepared for the early grass, on which they are finished.

Many of these small cattle are permanently arrested in their journey, and kept on the low farms to consume the coarse grass, which other breeds refuse to eat; these are finished off on turnips, which are given to them in the field about the end of autumn and they are sold about Christmas.



THE WEST HIGHLAND COW.

In the Outer Hebrides the black cattle are small but well proportioned, and on the tackmen's farms they are generally of good breed, and, although not heavy, very handsome. They are covered with thick and long pile during the winter and spring; and a good pile is considered one of the essential qualifications of a cow.—

The most common colors are black, red, brown, or *branded*, (that is, a mixture of red and brown in stripes — *brindled*.) A whitish dun color is also pretty frequently seen. The breed of black cattle has been greatly improved of late years, by the importation of bulls and cows from various parts of the Highlands.

Editorial, &c.

G. BECKLAND, ESQ., EDITOR.

H. THOMSON, ESQ., ASSISTANT EDITOR.

HINTS FOR THE MONTH.

Field operations,—ploughing, sowing, &c., may sometimes be commenced in the western portions of Upper Canada, in the earlier part of April, but as a general rule not till the latter half of the month, and very rarely, in extremely backward seasons, not till the first of May.

The first part of April will, or should be occupied in thoroughly finishing up the winter's work, looking after the sheep and cattle, repairing fences where required, and in getting all things, *z. e.*, implements, harness, seed-grains, &c., in complete readiness for putting the seed into the ground so soon as the season is sufficiently advanced.

One of the first matters requiring the Farmer's attention when the frost leaves the ground, will be an examination of his wheat fields, in order to discover if any of the drains have become obstructed by the winter's frost, and if so, to open them out with the spade, and give free outlet to all the surface water.

As the getting a good growth of clover and grasses, is one of the most important objects in farm-husbandry, and as it very frequently happens that the best intentions in view of this result are attended by failures, it becomes very desirable to learn the most probable means of insuring success. The first thing necessary is to obtain sound and clear seed, and if this be secured, about 10lbs. of clover and timothy mixed, say 6lbs. of the former, and 4 of the latter per acre will be sufficient. We have known on new land 3lbs. of clover give an ample growth, but it is safer always to sow liberally. If intended to sow the seeds on winter wheat, experience has shown that, on clay lands there can scarcely be a better plan than to sow in early spring, just as the winter's snow has nearly left the ground. The seed settles into the cracks of the honey-combed surface, with the melting snow, and as the particles of soil crumble down it gets well covered, and germinates before the wheat plant shades the ground so much as to keep it down

altogether. The above will be found the best plan on clay soils, when there is a thick growth of the wheat plant; if the latter is somewhat thin, it may be advisable to defer sowing the seeds till the beginning of May, or till the ground is sufficiently dry to admit the use of a light harrow or roller. On sandy soils, the best method is probably to sow as soon as the ground is dry enough to allow the roller to be used upon it. With spring grain clover may be sown after the last harrowing given the grain, and covered either with a very light harrow, roller, or brush, or may be sown as is frequently done when the grain is a few inches in height, and rolled.

Spring wheat is not now much sown, except in the back townships, and in consideration of the uncertainty of the crop, and the inferior price it brings, few farmers whose land will produce good fall wheat would think of sowing spring varieties. Circumstances, however, occasionally render it convenient to sow a portion of the farm with this grain, and in such cases, it is always found the best plan to sow as soon as the ground is dry enough to allow the plough and harrow to be used freely, or to bear the horses firmly. This in ordinary seasons, in Western Canada, will be from the 15th to the 25th of April, and the grain may then be sown, on land that has been well ridged up and surface drained the previous autumn, without any further ploughing. Soil treated in this way is so finely pulverized by the winter's frost that it forms an excellent seed bed, and if sown and harrowed in at the right moment, it retains a sufficient degree of moisture during the summer. There may be cold or harsh weather, after the early sowing of a field of spring wheat, and the farmer may fancy that his labor is premature, but he will find that the seed has been germinating all the time, and with the first return of genial warmth, it will be up, and shading the ground well before there can be any fear of too dry weather setting in. Unless this crop be sown in good time, there will be but little chance of a remunerating return. But the farmer must wait patiently till his field has got into good working condition before he attempts to sow. His labor will have a very unsatisfactory result, if he does otherwise. And after sowing, the dead furrows and cross drains, should

be opened out, with almost as much care as for winter wheat.

Barley is also an early sown crop in this portion of Western Canada, and may likely be sown to advantage on good clean land that has been ridged up the previous fall, without further ploughing in spring. Many farmers, however, contend for a somewhat late sowing of this crop, and for ploughing the land several times in spring, and we have known this method sometimes attended with successful results, but experience has generally shown that early sowing, that is, as soon as the earth and the air have attained a kindly dryness and warmth, has been followed by the finest sample, and the greatest number of bushels per acre.

The remaining crops, which will require the farmer's attention during this month, are peas and oats, both of which require good and clean land, and considerable care, to insure good returns. Of late years the *Bug* has been destructive to the pea crop. It has been recommended as a precaution against this insect, to sow peas of two years previous growth, when the bug would have disappeared from the seed. A correspondent in another column recommends sowing an early dwarf variety in June. Oats, it is well known, are apt to degenerate in weight in this climate. Care is therefore requisite in the selection of the best quality of seed. A liberal quantity, say three to four bushels should be sown per acre, and on good strong land.—Peas and oats do well on sward, ploughed up either in spring or autumn, and sown in good season.

In addition to the crops above mentioned, if the farmer sows in April an acre or two of tares mixed with rye or oats for his horses and cattle, when grass is short, he will do well. Potatoes, Indian corn, turnips, &c., may be thought of in May. The season may be such indeed that many farmers may not be able to sow an acre of any kind till the beginning of May. But as an instance in point, as to the time in which spring crops may be sown in Upper Canada, we have known a farmer in the Township of York, who never failed for many years in getting the whole of his field crops sown before the close of April.

AGRICULTURAL INFORMATION.—SALT AS A MANURE.

The suggestions of our correspondent under the signature of a LABORER, relating to the supplying of the *Agriculturist* with important practical information from all parts of the Province, will, we trust, receive due attention by those whom it now immediately concerns. Something of the sort we have for a long time desired. If each society would send us some brief information only once a year, our pages would soon indicate the state, progress, and wants of Agriculture throughout the extensive and diversified range of Upper Canada.

There can be no doubt that in a country so far removed from oceanic influence as is this section of the Province, that salt is not only a very necessary condiment for cattle, but that it exercises a fertilising influence upon the soil. This substance is the only compound from which plants can readily obtain chlorine, an element which enters more or less generally into their composition. Salt is found to sweeten pasturage, and to give both brightness and stiffness to straw, and to assist in filling the grain. It has been found useful, applied in small quantities, to the compost heap. It can have no influence in fixing the Ammonia, but by arresting decomposition it may retard the formation of that valuable compound, till it be required by the wants of the growing plant. The application of salt to manure heaps intended for immediate action, as in the case of turnips, for example, we should think quite objectionable. In such cases it would tend to impede the solution of those ingredients for which the young plants have large and imperative wants. A dressing of salt on Mangel Wurzel, Asparagus, and other plants, particularly in high situations remote from the sea, has been found highly beneficial. Care should be taken not to apply it to growing crops in too large doses, or it will have a parching effect on the young plants, causing their leaves and stems to wither and decay. A strong solution of salt poured upon grass has this effect, but the rains of autumn will restore the plat to an unusual verdure, and the sweetness of the herbage will be found particularly grateful to cattle.

The passage in the New Testament, (Matt. v. 13.) mentioned by our correspondent, refers to rock salt, which by exposure to air and water would become more or less deprived of its saltiness. We are informed by travellers, that in Palestine an impure, earthy rock salt is sometimes to be seen on the abrupt side of a hill, and that the material is employed for making roads, "trodden under foot." Maundrell, an old traveller and accurate observer, speaking of the exposed rock salt of Palestine, observes:—"I broke a piece of it, of which, that part that was exposed to the rain, sun and air, though it had the sparks and particles of salt, yet it had perfectly lost its savour."

The American salt is not generally, we believe, so pure and strong as the English; and the impurities which it contains are frequently prejudicial to the curing of meat and the making of butter and cheese. Salt of the purest and best quality must be employed in these operations, in order to obtain articles of the most approved kind and flavour.

THE JAPAN PEA.

We have heard a good deal lately about a new leguminous plant, said to come from seed brought from Japan.

Mr. Teschemacher, an American writer, gave a description of the plant, which he calls *Cajanus bicolor*, a native of East Indies, Amboyna, Japan, &c.; flower small, interior yellow, vexillum purple, erect shrub, pubescent, nearest in alliance to *Lupinus*. The seeds are good to eat, and when young, very delicate. On soaking the round seeds for an hour in moderately hot water, they take exactly the form and appearance of the common white bean, become quite tender, and have a pure and delicious nutty and oily flavor. *The whole plant, with the seed, is excellent for fattening hogs and cattle.*

A discussion took place lately at the American Institute, New York, in reference to this plant, and letters were read from members of the Institute who had cultivated it. A Mr. Ernst of Cincinnati, appears to have grown it

largely and considers it a valuable addition to the leguminous crops of America. The seed is as good as the common white bean for food, and better adapted for rich soils and warm climate, and the straw is excellent fodder for stock; and it promises to yield bountifully of both. In planting the peas, care must be taken to give them plenty of room to spread, as the stalks grow from three to four feet high, with an erect bushy stem, having numerous branches which are thickly set with short, woolly pods. It seems to delight in a rich, loamy, moderately dry soil, and a rather warm climate; but it does not need a very long season. It seems to be a most prolific bearer, and no doubt will prove a valuable crop.

From the accounts we have read, we should think it would succeed well on suitable soils in Canada.

Literary and Miscellaneous.

WILLIAM McDUGALL, Esq., EDITOR.

We have much pleasure in presenting to our readers the 1st of a series of articles on "Familiar Chemistry," from the pen of a lady who has earned for herself a high reputation as a writer. She stands in the front rank of female writers in Canada. Mrs. Thomas is a woman who reads and *thinks*, and who is neither ashamed nor afraid to express her thoughts, even on subjects which are supposed to interest but one half of mankind. Her writings so far as we know have hitherto related chiefly to political and moral questions, but it must have been obvious to the reader, that her studies embraced a much wider field, and that the material world and the physical sciences had not escaped her attention. It is a singular fact that some of the best elementary treatises on Chemistry and Natural Philosophy, have been written by females. The "Conversations" of Mrs. Marcet, though written some years ago, are still used as text books, and the compilations of Mrs. Willard and other American female writers, hold a high place among school books. There seems to be a delicacy of apprehension in the female mind, that detects every obscurity, and an ingenuity of ex-

pression that is peculiar to the sex. No one can make the child understand so well as the mother.

The contributions of Mrs. Thomas to the *Agriculturist* will be adapted to the wants and capacity of our youthful readers, and we hope the the "Farmer's daughter"—an interesting, but too often in the matter of education, a much neglected member of the family—will read and profit by the "familiar" lessons of Mrs. Thomas in this department of our journal.

FAMILIAR CHEMISTRY.

BY MRS. M. F. H. THOMAS.

CHAPTER I.

The season of renewed life and beauty—of love and gladness, is at hand. The drifted snow will soon have passed from nature's broad bosom, and teeming life will take its place. LIFE—that great principle which is ever, the breath of God, the Creative Energy—which, from the shapeless dust we tread, from the impalpable gasses we breathe, and the formless waters, fashions such infinite variety, beauty and vigour—that perfect adaptation which stamps the universe with unity.

"All parts of one stupendous whole."

And while we behold nature's resurrection, and admire the glorious metamorphosis of our earth, it enhances that pleasure immeasurably to—

"See the pulse of the machine."

To watch the wonderful processes by which all those forms of living beauty are elaborated.

First, however, to understand them well we require to know something of the elements and substances around us. Chemists have resolved all discovered substances into fifty-five elements, or simple principles; of these, but four enter, in any important degree, into the composition of organic substances; and are therefore all which are legitimately included in the province of organic chemistry. They are oxygen, nitrogen, hydrogen and carbon. The atmosphere is composed of the two first, in the proportions of one volume of oxygen to two of nitrogen. In the atmosphere these gases are not chemically united, but mechanically mixed. They unite chemically in five different proportions; the result being, in every case, a subtle poison; of which nitric acid, commonly called aqua-fortis, is an example. In this fearful poison the proportions do not differ materially from those in the atmosphere, the difference being the mode of admixture.

The atmosphere contains, also, a small quantity of aqueous vapor (water in a state of vapor), of ammonia, a gas evolved from decaying organic substances, and of carbonic acid,—a mixture of carbon and oxygen,—the result of combustion of every description, from the coals in the grate to the flaming prairies of the west, and "cities laid in ashes." It is also evolved by breathing. Air, in the lungs, is subjected to a process analogous to combustion, by which it is loaded with carbonic acid, and aqueous vapor. Carbonic acid is destructive to life, and being heavier than common air, has a tendency to settle down; and the consequence is, the "fixed air" in wells, and other excavations by which so many lives have been lost. A candle or burning brand introduced into the suspected locality is, however, a sure test of its presence in sufficient quantities to endanger life. If danger exists, it will at first burn dimly, and at length go out, as air which will destroy life will not support combustion. How often in crowded assemblies have we seen the lights, as the night waned, burn dimly? Did you ever think why? It is a warning that the vitiated air can no longer be breathed with impunity. Oxygen is the supporter of life and combustion. Combustion being, in fact, but the rapid union of oxygen and some other substance, usually carbon, as that forms the chief part of wood and coal; and the product of course must be carbonic acid. The larger the quantity of oxygen contained in the air we breathe the more life and vigor it imparts; though the inspiration of pure oxygen is harmful, as it excites the organism to unnatural action.

On the contrary, when the air is loaded with carbonic acid, we feel languid, dull, and sleepy. How often, especially during the winter season, is this the case with almost every person, confined in close rooms, ill ventilated, and perhaps overheated. All persons should spend as much time as possible in the open air, as there only, are they free from unhealthy vapors. It would seem that the air thrown out from the lungs, would be re-inhaled, at least in part, at the next inspiration. This would be the case, but for a most beneficial law of nature, (to be explained hereafter,) viz.: that heat lessens the gravity or weight of bodies, causing them to rise through a heavier medium. The air becomes warmed in the lungs; and hence lighter than the surrounding atmosphere, through which it rises, leaving a pure strata for us to breathe.

Winds are of use, also, in purifying the air,

and preventing stagnations of mephitic vapors. They also preserve the equilibrium of temperature, being developed by the inequality of heat. The air, becoming from local causes, overheated, or overcooled, forces the warmer and rarer to rise till it reaches a stratum of its own density, while the cooler rushes in to supply its place. A double purpose is therefore served. The equilibrium is preserved, and the air is purified. Winds and storms, are in fact, remedies for diseases in the outer world, which if not checked would prove terribly fatal. So we ought to take them as they come, and be thankful, even if they should destroy our crops or cause us other inconvenience. As the different ingredients of the air are of different gravities, it might be supposed that they would separate into different strata. Such would be the case but for the property which gases possess, of *intermixing* when mingled, even without chemical affinity. For instance, carbonic acid is much heavier than common air; and nitrogen is much lighter, yet place a bell glass containing nitrogen over a vessel of carbonic acid, and the gases will intermix to a great degree; or in other words, the carbonic acid will rise in part, and the nitrogen sink.

The question may suggest itself—What becomes of all the carbonic acid generated by so many natural processes? Will not the air in time become fatally vitiated? Nature is self-regulating. The vegetable creation is the grand purifier. In that immense stores of carbon are *locked up*; as it constitutes the solid parts of plants. Under the influence of light, plants decompose carbonic acid, appropriating the carbon, and throwing off oxygen—the life of animals. Without light, however, they exhale carbonic acid, thereby becoming soft, white, and juicy. It is carbon which gives solidity. Light is also supposed to possess considerable influence over the animal organism, in preventing deformities, or favouring perfect development. Tadpoles secluded from light never become frogs, but remain always the same, or become unsightly monsters. People who live in dark lanes of cities, and in cellars, are often deformed, unhealthy and depraved; and fashionable *ladies* and *gentlemen*, who shun the life-giving kiss of the great source of life, are *tallow* white, lymphatic, like darkness-bleached plants, and emphatically *greenish*. Light also dispels bad vapors, and is a potent agency in the cure of disease; as the experience of the most celebrated physicians testifies. Epidemics are always more prevalent and fatal on the

shaded sides of narrow streets. How absurd then to keep the rooms we occupy, so secluded from light, as to live in perpetual twilight! What if the cheek should get a little browned? The well formed body and the glow of health, will impart a charm which will throw bleached faces, and deformed shapes, *into the shade where they belong*.

Brooklin, March 8th, 1854.

GEOLOGY—NO COAL IN CANADA.

The following report of a Lecture on Geology by Professor Hind, is necessarily imperfect without illustrations. It is copied from one of the city journals, and will be read with interest from its reference to the important subject of coal. The Provincial Geologist, Mr. Logan, as well as other men of scientific eminence, have pronounced the opinion that Canada is, geologically, below the coal measures—that when our timber is destroyed, our fuel will be exhausted! This is a fact of great import to the Canadian farmer, in view of the long winters he must prepare for.

On Friday evening, March 3, Professor Hind delivered a masterly lecture in the Mechanics' Institute, in this city, on "Geology." We give below an outline of the topics handled although the technical nature of the subject renders it somewhat difficult to frame a literally correct report. The Professor commenced by saying that the very remarkable interest which had been taken during the last few years in the study of Geology had induced him to endeavour to present a popular view of the Geological structure of Canada West, in relation to that particular portion of North America, of which it forms a part. It was scarcely possible to form an idea of the geological structure of a country like Canada, without taking a comprehensive view of the whole structure of the Continent on which it was situated, and he proposed, therefore, that evening to give a lecture on Geology generally, in special relation to the Continent of North America, reserving a more minute explanation of the Geology of Canada for another lecture. Referring to an ordinary map of the North American Continent, and a coloured Geological map of the United States and Canada, the lecturer pointed out three great chains of mountains, firstly, the Laurentine Mountains, forming the boundary between Canada and the Hudson Bay Territory, and having an altitude varying from 1200 to 2500 feet; secondly, the Alleghanies, running along the east, and lastly the Rocky Mountains to the west. These three systems of mountains formed a gigantic triangle, which, it would appear, in ancient and very remote times formed the boundaries of a vast sea. There was another very important and

most curious fact which should be recognized, that all of these mountains were of different ages. There is scarcely a single range of mountains on the Continent of America which may be considered contemporaneous with another range. The Laurentine Mountains are the oldest, and the Alleghanies appeared at a far later period in the history of the earth; the geological age of the Rocky Mountains varies very much according to the particular point selected for examination. The lecturer then proceeded to explain the nature of the various classes of rocks which appear in Canada, superimposed the one above the other, and each appearing in succession at the surface in different sections of the country. A geological section of the country from Quebec to St. Louis illustrated this succession. Beginning at Quebec, we find a remarkable series of rocks occupying the valley of the St. Lawrence, and the whole of the country north of Lake Ontario, &c., and known as the Silurian group, which was the most ancient system of rocks deposited at the bottom of the great sea, bounded by the three chains of mountains before referred to. But beginning with the Primary Rocks—of which specimens might be seen in the huge boulders scattered over our fields, and which were composed, generally speaking, of granite—there could be no question that a vast trough of granite rocks extended from Quebec down to Texas—that this hollow trough once formed the bed of a sea—and that time after time, amid a thousand revolutions, vast masses of rock were deposited, one over the other, in this huge trough, until the period of the coal arrived. Commencing at Quebec, as he had already stated the first series of rocks deposited was seen to be the Lower Silurian. The manner in which it was deposited was illustrated at Lake Huron, where we frequently found a series of small islands, having a nucleus or centre of granitic rock, around which is deposited the Silurian rock containing the remains of a large number of shells, and still bearing the impress of waves firmly engraved in the solid rock, and found at a depth of very many feet beneath the surface. In the immediate neighbourhood of this city, Mr. Hind said he had found similar specimens, bearing ripple marks 7 or 8 inches in breadth, one of which he exhibited to the audience. The specimen consisted of what originally had been a series of layers of very fine mud, which were first impressed by the gentle ripple of a wave, and then hardened in the sun, and in course of time consolidated. Some of the specimens in his possession, taken from this neighbourhood, were found at a depth of 40 feet. The lowest member of the Lower Silurian group commencing at Quebec, is the Potsdam sandstone, in which are found the remains of animal life in the form of minute shells. The celebrated Provincial Geologist, Mr. Logan, had also discovered in it the tracks of different animals, which had excited the greatest possible discussion among learned men in Europe. This rock extends from Quebec all the way across the country to New Mexico and Texas, and perhaps, further investigation might show, still further. Its thickness in some parts is about 400 feet. Sometimes it is beautifully even, as if

deposited at the bottom of a calm and tranquil sea, and at other times it is found very much distorted. From the remains discovered in this Potsdam Sandstone, it would appear that at that period of the world's history, there was but a very small amount of animal life in existence. The next member of the Lower Silurian group to be noticed was the Kingston Limestone, geologically known as the Trenton Limestone. A number of the fossils found in this stone, Mr. Hind said, he would exhibit at his next lecture. He had that very day, he said, received a letter from a barrister at Bytown, who appeared to have made some remarkable discoveries as to the fossils found in this limestone, which would excite great attention not only among geologists, but among the public generally. Trenton Limestone is a rock of astonishing interest, containing an infinite variety of organised forms. On Lake Simcoe, there were thousands and tens of thousands of thousands of cubic feet composed of corals, evidently once the abode of an animal very similar to the sea-worm, which built those remarkable structures, known as the coral rocks. Some beautiful corals were here exhibited, by the lecturer, who next proceeded to speak of the third member of the group, known as the Utica slate, which was found developed in Whitby to a large extent, being disposed on the Trenton limestone with great uniformity. The Utica slate possesses some very peculiar characteristics. It contains the remains of a very singular variety of animals, and is also found to be very rich in sulphur and other materials. Hence the fact that sulphurous and saline springs are so common in the Townships where the Utica slate is found. Its thickness is in general about 200 feet. The next and last member of the Lower Silurian group is that on which Toronto stands. If the clay were to be removed, we would see below us an extremely beautiful and highly polished rock, extremely rich in organic remains, and containing the marks of waves and even the impress of rain-drops. (Specimen exhibited.) Specimens, bearing the impress of rain-drops are very common in this neighborhood. The name given to this fourth member of the series is the Hudson River group or Lorraine shales. Animal remains might be found in these rocks in countless multitudes. In this immediate neighborhood, in the River Humber, on the Don, and wherever we remove the clay, we would come to corals two or three feet in thickness, and sea shells. Such were the four rocks which belonged to one great epoch in the earth's history, known as the Lower Silurian epoch. After these four members of one group had been deposited, a very peculiar change must have come over the condition of the earth, because we find from the remains in the other rocks which lie superimposed upon these, a change of a most extraordinary character in the animals which flourished during the next period. We find that the animals assumed apparently a higher degree of organization; we find corals for example developed to a much greater degree, and shells existing to a much larger extent, and also animals which approach nearer and nearer to the general type of the fish. In illus-

tration of this part of his lecture, Mr. Hind produced a beautiful coral obtained in the Upper Silurian formation in the neighborhood of Woodstock, where he said fossils of singular beauty existed in such innumerable multitudes that the geologist was at a loss which to take first. Last summer he brought home with him from that district two or three hundred weight of different varieties of corals. To the Upper Silurian group succeeds the Devonian, the only one remaining to be spoken of as developed in Canada. During this period an immense number of rocks were deposited, but in Canada there were few representatives of them. This was a matter of very great importance, as the whole question of the presence of coal is dependent on the presence of certain rocks, belonging to the Devonian period. Unhappily, we find that, as developed in Canada, the Devonian rocks not only pass completely over the western portion of the country but extend into the United States several hundred miles. Above the Devonian group comes the Lower Carboniferous, that particular species of rock which was deposited before the formation of coal to any considerable extent, the anthracite coal, however, having been deposited long before the Lower Carboniferous group. The coal fields of North America repose in the centre of the great geological trough formerly described. There was no question, however, that at one time coal extended to Canada, and that it was found not only in the valley of the St. Lawrence, but developed to an enormous extent towards the north. Neither could there be any question that coal once existed to a great extent in the Hudson's Bay Territory, but all this vast deposit of coal, not only so far as this country was concerned, but also to a great extent so far as the United States was concerned, had been swept away by a vast system of denudation by the action of water. As had been proved in two distinct ways by Mr. Logan, the geological structure of the country was such that no hopes could now be entertained of the discovery of coal in Canada. Returning to the three systems of rocks, with the notice of which he commenced his lecture, Mr. Hind said there was not the least reason to suppose that the Laurentine mountains were formed after the great sea of which he had spoken existed, but every reason to suppose that they were formed before. This was known by the circumstance that all the rocks which he had described repose in perfect uniformity on the primitive granite of the Laurentine Mountains. Not so, however, with the Appalachian chain, or the Alleghanies. These were found to penetrate in a curious mode all the various groups of rocks to which he had called attention. Certain portions of the chain come through, uplift, pass over, and frequently overflow the Lower Silurian, Upper Silurian, Devonian, and Lower Carboniferous, so that several portions of the Kentucky coal-field were raised several thousand feet in the air. Finding that the coal beds no longer preserved their horizontality but were pushed up, some on one side, some on another, geologists inferred that that chain of mountains must have been called into existence after the formation of the coal. It had been ascertained that there were

six different mountain ages belonging to this continent. The oldest was the Laurentine. The next in order was that which gave its name to the County of Two Mountains in the valley of the Ottawa—a peculiar mountain which must have been uplifted immediately after the deposition of the Potsdam Sandstone, through which it had broken, but the Trenton Limestone lay conformably upon it, showing the precise period of its formation. The Montreal Mountain again was upheaved after the Trenton Limestone, but before the deposition of the Utica Slate. Then came the Green Mountains, which are ascertained to have been raised after the deposition of the Lorraine Shales. And so with the rest, the most recent being the upheaval of the Alleghanies. Independently of these vast movements, there had from time to time occurred movements of a lesser character, but of great importance to us, originating the mineral beds which were found to intersect the whole region north of Lake Superior and Lake Huron, and in fact the whole of the Laurentine Mountains. In travelling along the shores of Lake Huron or Superior we could scarcely go ten yards without coming across what is called a fault. We should discover veins of granite rock which had apparently been injected into the original granite rock. These are called dykes, and the phenomenon which has given rise to the dykes is called a dislocation. Suppose that some portion of a mountain by some force from below becomes slightly upheaved, it is clear that sinking down again to its original position the parts may not exactly fit into each other, and the consequence will be that there will be cavities produced between the lines where the rock has slipped. These cavities become filled with infiltrated matter, either with a substance in the form of a mineral or pure metal, on Lake Huron and Superior with copper for example, sometimes found perfectly pure. (Specimens of copper produced.) These dykes which are discovered to such an immense extent on the shores of Lake Superior and Lake Huron have occurred at different periods, but there was little question that almost all of them were anterior in their origin to the formation of coal. Mr. Hind then referred to three remarkable rocks, which still bore evidence that they constituted islands in the primitive Silurian Sea, and concluded by showing from certain appearances in the centre of the great American Geological trough, that an upheaval had taken place extending towards Canada, which rendered it impossible that the Michigan coal-field extended into Canada West.

SPRING.

For the Agriculturist.

"Tis a month before the month of May,
And the Spring comes slowly up this way."—Coleridge.

To the Canadian the month of April is not the most interesting; the weather is frequently unsettled, and the ground is not sufficiently dry to commence farming operations. The snow which had covered the field gradually disappears,—the frost which had held every

thing with an iron grasp begins to relax its hold and the face of Nature presents the appearance of a released captive who had long worn the chains of slavery, but who now, finding himself at liberty, leaps and sings for joy.

Stern Old Winter, who for months had reigned with despotic sway, has now died a natural death, and over the once powerful, but now harmless tyrant, the stormy wind from the North howls his requiem, and the mild breezes of Spring are slyly kissing the flowers already springing from the jovous earth. Spring comes like a blushing maiden, with sweet smiles and merrily step; her spirits are buoyant and she diffuses animation and vigor everywhere around. The inviolable, whose cheeks the western breeze had not fanned for months, now ventures out and in the face of Nature he sees an emblem of himself. The denizens of the forest, that had lain dormant during the winter, now come forth, and, as it conscious of their misimprovement of time, seem desirous to make amends or atone for their long stupor by increased activity and renewed diligence.

But if April has little in itself to interest the Canadian, the case is vastly different with those who have been brought up in the British Isles; they have been accustomed to see vegetation in this month in a forward state, in the salubrious climate of Great Britain, weeks ere this. The fields are covered with their native green, the trees put forth their buds, the "buds and brues" are plentifully bedecked with primroses of various hues, the daffodil and snow-drop are already in bloom, the husbandman commits the seed to the bosom of the earth; and waits in patience the return of a bountiful harvest.

Every hedgerow, brake, tree, and wood, is rendered vocal by the voice of tuneful birds roused by the skylark, that "shrill-voiced messenger of morn," while from its "low and grassy bed" starts melodious, "the shadows have fled, and soars to the clouds to meet the approaching sun. These are but a few of the many pleasing recollections which, at this particular season of the year, force themselves upon the contemplative mind; and although our beloved Canada—our adopted home—possesses advantages infinitely superior to the land of our fathers, still we have frequently to "check the rising sigh," when the dear scenes of our youth come up in rapid succession before us, and, though the all-destroying hand of Time has left its impress upon everything around us, we retain as lively a recollection of them as though we had seen them but yesterday.

The Canadian farmer, who, for the last four months, had little else to do than attend to his cattle, cut and haul his firewood take out lumber for building purposes and carry his produce to market, is once more called upon to resume his toil; his sons, who, during the winter months, had been cultivating their minds at the neighboring school, are now kept at home, and are busily employed repairing the dilapidated fences, making sugar, collecting and preparing their farming implements, so that when the ground is sufficiently dry, they can at once commence operations. The prospects of the farmer were never brighter than now; everything that he has got to sell commands a high price; he need not be afraid to sow all the land he can spare in wheat, it will be all wanted. Let him, then, go forth to his labour with renewed energy and vigor, thankful, at the same time, that while many of the "nations of the earth" are convulsed with war, he can, in this happy land, "sit under his own vine and fig tree,—none daring to make him afraid."

R. S.

Reviews, &c.

The Anglo American Magazine—March, 1854. Toronto: Maclear & Co.

Among the principal contents of the present number may be mentioned, the continuation of the "History of the American War of 1812; the "Review of Abbott's Napoleon Buonaparte;" "Chronicles of Dredgaily;" "The Origin of Sea-Sickness;" "Confessions of a Junior Barrister;" "The Blankshire Hounds;" "The Editor's Swanty" contains as usual much amusing, and frequently really useful, information accompanied by flashes of wit and genuine good humour. The illustrations consist of a plate of the Fashions, a well executed view of Frederickton, New Brunswick, and a lithograph of the forever celebrated world's disturber, Napoleon Buonaparte.

Our readers should remember that the "Anglo-American" is essentially what its title denotes, a *British-American production*, and is richly deserving a liberal and wide-spread support.

Transactions of the Wisconsin State Agricultural Society.—Vol. 2: 1852. Madison: Beriah Brown, State Printer. 1853.

We are indebted to the worthy and efficient Secretary of the Wisconsin State Agricultural Society, Albert C. Ingham, Esq., for another volume of their Transactions. In addition to the usual Report of the State Society, and the Reports of the County Societies, the volume contains several interesting Essays on various Agricultural topics. "The Relation of Crops to Soils," by Dr. Lathrop; "On the Adaptation of Crops to Soil and Climate," by John Y. Smith; "On the Different Breeds of Neat Cattle," by T. P. Turner, and several others, will well repay a careful perusal. A copious list of the Fauna and Flora of Wisconsin is appended, with tables of Meteorological observations for the year 1852. We shall return again to this interesting Report hereafter, in the meantime we beg Mr. Ingham to accept our best thanks for his courteous consideration.

EDITOR'S NOTICES.

AGRICULTURAL REPORTS.

Reports have been received at the Office of the Board of Agriculture, to the present date, from the following Counties:—Waterloo, Stormont, Oxford, Addington, Hastings, and Ontario.

All subscriptions to Township and County Agricultural Societies for the present year, are required by law to be paid into the hands of the Treasurer of the County Society, on or before the 1st day of May next. March 22nd, 1854.

AGRICULTURAL SEED.

We beg to call the attention of our readers to Mr. Fleming's advertisement in the present number. Mr. Fleming has on hand an extensive stock, selected with care and judgment from some of the most respectable Seedsmen in Great Britain; and as he makes a practice of testing the vitality, and purity of his seeds before offering them for sale, the public may safely calculate on being well served.

CONTENTS OF No. 4.

Agricultural correspondence 111
 Cleonistry, Mr. Thomas on "Familiar" 121
 Clearing Land in Canada 102
 Coal in Canada - None 121
 Cattle - West Highland (cut) 117
 Drainage - Modern System of 107
 Drainage - Cost of in New York State 113
 Drainage - Discussion on at Colbourg 98
 Education of Farmers' Daughters 108
FARMERS' CLUBS:
 Hamilton Township - Drainage 97
 Guelph Club - Clearing Land 101
 Water on " - Sheep for Canada 105
 East Zorra " - Fencing 106
 Farming - Exhaustive system of 111
 Fencing - Discussion on 106
 Grass - Rust and Mildew in 109
 Geology - Lecture of Professor Hild on 123
 Hints to the Month - of April 121
 Japan Pea - Notice of the 122
 Live Fences in Canada 111
 Manure - Farm Yard, How to Manage 114
NOTICES:
 Anglo American Magazine - Transactions of the
 Wisconsin State Agricultural Society - Agri-
 cultural Reports, - Agricultural Seed 127
 Peas, Best Mode of Growing 111
 Peas - How to prevent the Bug in 121
 Roots in Water, Mode of Saving 110
 Salt as a Manure 121
 Seed, How to Separate 110
 Spring Vermion on 126
 Sheep - Vermont on 111
 Sheep, Best breeds for Canada 105
 Stabing Stock 113
 The Machine, Description of Stragg's (cut) 113

FRESH

GARDEN, FIELD AND FLOWER SEEDS.

THE Subscriber begs to inform his Friends and the Public, that his Stock of Fresh Seeds for Spring sowing is now complete.

The Stock of Agricultural seeds is well selected, comprising a fine Lot of Imported.

- | | |
|-----------------------------------|---------------------------------|
| Purple Top Swede Turnap. | White Sagar Beet. |
| Yellow Aberdeen do. | Yellow Globe Mangel Wurtzel. |
| White Globe, and other varieties. | Long Red do. do. |
| White Belgian Carrot. | Spring Lates, or Vetches. |
| Long Orange Astriguum, &c. | Red and White Clover. |
| Field Parsnips. | Timothy, and other Grasses. |
| Spring Rape and Cow Grass. | 100 Bus. Good Seed Barley. |
| White Marrow-fat Peas. | 600 Bus. common Oats. |
| Blue Imperial | 100 " Early Ash Top Potatoes. |
| Early and Late Field do. | 300 " Early June. (Globe sort.) |

The Subscriber has also a full and general assortment of all kinds of GARDEN SEEDS suitable for the country - a catalogue of which, with directions for sowing seeds, can be had gratis on application.

Twenty Packets of choice Flower Seeds will be sent free by Post to any part of the Province, to the address of any party remitting \$1, free of postage.

JAMES FLEMING,

Seedsman to the Agricultural Association of Upper Canada

Toronto, March, 1854.

STUD HORSE FOR SALE.

A BEAUTIFUL BAY HORSE, with black legs, mane and tail; stands sixteen hands and a half high, rising four years old - without fault or blemish. He was got by Mr. Blanchard's imported King George, and is as pure a bred coach horse as can be found in the province.

Further particulars can be known by applying to the proprietor, WILLIAM DRINKWATER, Lot 16, 3rd line west of the Centre Road, Chingacousy, Co. of Peel.

Feby. 23th, 1854.

SEWERAGE AND DRAIN-PIPE MACHINE.

MR. CHARNOCK begs to state that he will very shortly be prepared to exhibit one of his Machines in operation for Moulding Sewerage and Drainage Pipes of all description, as well as perforated Bricks, &c., and to receive orders for the same.

This Machine has been thoroughly tested in England, and is allowed by all competent judges to be the best extant for the purpose.

Early applications are desirable.

Se's of Drainage Tools, of the most approved kind, supplied.

Hamilton, 15th February, 1854.

HYDRAULIC AND AGRICULTURAL ENGINEERING.

MR JOHN HENRY CHARNOCK, Hydraulic and Agricultural Engineer, (a Member of the Royal Agricultural Society of England, and author of its Prize Report on the Farming of the West Riding of Yorkshire, as well as other papers on Drainage, &c., published in its Journal; and late an Assistant Commissioner under the English Drainage Acts,) begs to offer his Professional Services to the City and Town Authorities, and to the Agriculturists of Canada, and to solicit the honor of their patronage and support.

Having for several years past devoted special attention to that branch of Engineering which embraces more particularly works of Town Sewerage and Water supply, the Drainage, Irrigation and general Improvement of Land, the planning and erection of Sewerage and Drain-pipe works, Farm Buildings and Machinery, together with the laying out of Farms and Ornamental Grounds, Mr. Charnock ventures to think that such experience, coupled with a practical knowledge of the approved systems and appliances of the day, will enable him to render valuable and efficient services to those who may favour him with their commands.

Mr. C. is furnished with testimonials from numerous parties of known standing and repute, which he will be happy to submit to those who may contemplate employing him. And all communications addressed to him, CITY OF HAMILTON, CANADA WEST, will have prompt attention.

JOHN H. CHARNOCK.

OFFICE, JAMES'S STREET, HAMILTON - At Mr. Simons, Land Agent, close to the St. George's Hotel Hamilton, 15th February, 1854.

NOTICE.

DURHAM BULL CALVES.

THE Subscriber does not intend to rear any Bull Calves for sale this Season, unless to Order. Five thoroughbred Cows, Duchess or Bates blood, are now expected to Calve. Intending Purchasers will, of course, be at liberty to select.

ADAM FERGUSSON.

Woodhill, Waterdown, February, 1854.

THE CANADIAN AGRICULTURIST,

EDITED by G. BUCKLAND, Secretary of the Board of Agriculture, assisted by Mr. H. Thomson and the Proprietor. It is published on the 1st of each month by the Proprietor, William McDougall, at his Office, corner of Yonge and Adelaide Streets, Toronto, to whom all business letters should be directed.