

the stubbles, then with their mothers "folded" as it is called on the turnips, the ewes being obliged to eat the roots, whilst the lambs are allowed the range of the greens, and fatten surprisingly. When the lambs became fit for market, they were driven to London for sale, and the ewes fattened with the remainder of the turnips and other food, and finally sold off to the butcher, to be replaced late in the fall by a newly purchased flock. Well, for some reason that I cannot recollect, the flock was not purchased, and we relied on some neighbouring sheep to eat down the turnips; but the farmers had as many turnips as their own as they could consume, and ours remained unconsumed. In this strait, by the advice of an experienced labourer, who had seen such a course adopted, the crop was destroyed on the ground, and ploughed under; and the result was the largest crop of grain ever seen in that district.

Again, as another instance, that veteran editor, Joseph Harris, formerly of the *Gloucester Farmer*, in a lecture on the cereals, which he delivered at New Haven, Feb., 1860, says—"I was once on the farm of Mr. Matthews, of Swatham, in Norfolk, England, when he called my attention to a barley stubble, and said that the crop of barley from that field averaged seventy-five bushels per acre. It had been heavily manured for turnips, and the crop was very large, but not having stock sufficient to eat them, the greater portion rotted on the ground, and were ploughed in of course furnishing a large amount of manure, rich in ammonia."

As a further instance:—It was our custom, when we harvested and housed our mangels and Swedish turnips, always to cut off and spread on the ground the leaves of both kinds of roots; we never allowed them to be eaten, because experience had shown that when the leaves and greens were ploughed in, a splendid crop of either wheat or barley (whichever was sown) was sure to follow. In England, the turnips stand on the ground during the winter, and throw up high seed stalks in the spring; but the mangels must be housed, as the frost spoils them. The destruction of the turnip root in England on the soil is troublesome, owing to its vitality; but in Canada, if white turnips were sown and left exposed to the winter frost, they, as well as mangels, would be entirely softened and destroyed, and by spring time be ready for immediate amalgamation with the soil.

I will now give a Canadian instance. Some years since, a Scottish farmer on one of the worn-out farms in the Niagara district, had on his farm one twenty-five acre field, that from continuous cropping was so reduced, that no grain whatever would grow on it. He had no spare manure, as the farm would not grow straw enough to make it, but he was determined to thoroughly enrich this piece of land. He therefore prepared the field for mangels, planted them in drills, as well manured in the drill as he could manage, which was not much, but as the land had never before grown mangels they grew finely. He horse-hoed the roots, then, when the plants were large enough, he ran the cultivator across them in place of singling or pulling them out. He got a heavy crop of tolerably large roots, the whole of which were ploughed in, and the ground summer fallowed the following year, to kill the weeds. Fall wheat was then sown, and produced *sixty bushels per acre*. The wheat was seeded down well with clover, and as soon as the clover was in flower the next year, it was ploughed under with a ball and chain. This treatment got the land into thorough heart, and with judicious management since, that field, even till now, continues the best on the farm.

It is a well known fact that where sheep are not kept on mountainous or other extensive pasture, the English farmer neither makes, nor expects to make, any profit on the sheep over and above the manure which they furnish by consuming the roots and oil cake on the farm. If the sheep pay for the outgoings and interest on their purchase, and leave the farmer the manure free, he considers himself richly paid, and so he is. In Canada we do better than that, so far as buying and selling the sheep is concerned, but still the generality of farmers are content to keep but few sheep, and only those that they can winter through on pea straw, and some few roots, without difficulty. Sheep, in any great number, cannot be fattened or indeed kept successfully in Canada through the winter, without being housed, and it is not one farm in five hundred where three hundred sheep can be housed during the winter.

In *THE CANADA FARMER*, 16th April, 1866, P. Muriison writes—"I would like to know if ploughing in a turnip crop is a good plan for manuring ground. I generally take in the turnips themselves, and plough in the leaves. Which is the best?"

THE CANADA FARMER answers,—"If you have cattle to consume the roots, the latter is clearly the most judicious course."

Now I doubt this. I believe that the cattle and sheep take away more good than they leave behind.

I was discussing the matter with a clever Englishman who had been head labourer, or grieve, on a large English farm, where they made their own superphosphate; he had never discussed the idea of destroying turnips on the land before, and at first seemed to look on it as a horrible piece of extravagance; but when I told him the amount of solid constituents of the turnip, and how much of that must necessarily go into the sheep, and be carried away with them, perception dawned upon him, and he exclaimed in a sort of rapture, "Yes, you are right; I see it now. If you were to take all the lambs which can be bred up on one hundred acres of turnips, and dissolve them with sulphuric acid, you would have a grand lot of superphosphate, enough to manure two such lots of turnips, and by feeding these turnips on the ground the sheep carry away the whole of it." Well, he was delighted at the discovery, and went away fully determined to grow and plough in all the turnips he could manage to get into the ground.

But few people are aware of the extent to which green crops are ploughed under in some parts of Canada. Thus, on the sandy land about what is known as the Long Point country, county of Norfolk, it is not unusual to plough in one, two, and even three sowings of buckwheat in the course of one season. The first sowing, possibly, will hardly cover the ground; the second is better, and the third is a full crop, the ground producing a good crop of wheat afterwards. But the season in that district is the longest in Canada, or otherwise they could not do as they do. When they can once raise a good crop of clover, they prefer to plough it under as soon as it is in flower, and then sow fall wheat afterwards; without clover their land in the sandy portions would not repay the cost of cultivation.

On the plains in Haldimand and Hamilton, back of Cobourg, they carry out the same system to a great length. The land there was bare of trees except oak scrub; it was a poor sand with a hard clay subsoil. For many years it was considered unfit for cultivation, until some of the Brantford plains people went down there. They began with buckwheat, following with clover and plaster, and soon showed the capabilities of the soil. By a gradual bringing up of the hard clay subsoil, they have greatly improved the sand, and they now adopt the following course:—"The wheat stubbles are ploughed under in the fall, then, as soon as the frost is out of the ground, and at the earliest possible moment, they sow a good thick crop of peas; as soon as the peas are well in flower, they plough them under with a proper implement, and sow buckwheat thick; the buckwheat comes to a full crop, and is again ploughed under in the fall; next year spring wheat follows, and they are sure of a first-rate crop. Plenty of clover seed is sown with the spring wheat. The next year, the clover is ploughed under as soon as it is in bloom, and that same fall winter wheat is sown, with the certainty of a first-rate crop. The wheat is clovered down, stands for hay, and the second crop is ploughed under for spring grain. If the clover heads are ripe enough, the spring crop is self-seeded with the clover. They then plough for another crop of oats, barley or otherwise, as the necessity of the farm requires. All the people there who have adopted this plan have become rich, and the land cannot be now purchased at any reasonable rate. These plain lands are very early, and the fall wheat is always ahead of the midge, and the quality of the grain is the very best in Canada; but the straw is short, and were it not for the green crops so ploughed under, manure would be out of the question. Plaster is freely used."

I have thus strung together all the information I could for the present obtain on this important subject. The success of the plan depends upon the length to which it is carried. One thing is quite clear—it cannot be carried too far. If it is found to make the wheat too gross, a crop of oats, barley or rye, will reduce the redundancy of the growth of the wheat, and bring it within reason.

Now I want all the persons who may read this, to find fault with it, pitch into it right and left, hit hard, make fun of it, do anything but pass it over in silence. There may and must be some good in discussion, but silence helps no one, not even to the extent of making them think.

Toronto, 21st October, 1867

VECTIS.

LARGE TURNIP.—The Windsor *Dominion* says:—"William Lovelace, 1st con. Mersea, has a small field of large turnips. The one sent here measures thirty-four and a half inches in circumference, eleven and a half inches in diameter, and weighs twenty-two pounds. We venture to say that the smallest turnip he has of this kind (white globe) will not weigh less than fifteen pounds. They grow on light sandy soil."

Discussion on Fertilizers.

In a recent number of the *Utica Weekly Herald* a very interesting discussion of the Little Falls Farmer's club is reported on fertilizers and kindred subjects, of which an earlier notice would have been given but for the press of exhibition matter and other items. An able address was delivered on the occasion referred to, by Mr. Miller, of Herkimer, on the application as a fertilizer of the refuse matter from the manufacture of straw paper.

He said the question of utilizing the refuse material from paper-mills had occupied the attention of paper manufacturers and others for some time. The manufacture of white paper from straw has now been going on some ten years. From the commencement of the business to the present time the trade has been increasing, and now seventy-five tons of paper per day are made from straw. It takes two tons of straw for a ton of paper. An immense amount of money has been spent to retain the alkali used in paper manufacture, and make it subservient some useful purpose. There is about fifty-five per cent. of waste in the straw. Soda ash is used in large quantities in the preparation of the straw for paper, and it is allowed to run to waste after serving that purpose. In every pound of paper there is a waste of half a pound of soda ash and one pound of straw. The soda is not injured, but is so combined with the various parts of the straw that no way has as yet been discovered by which it could be profitably separated. It could be separated by evaporation, but the expense was about as much as the soda was worth. At Herkimer, they are using 2,000 tons of straw per year, or an average of about six tons per day. There is daily a waste there of three tons of straw and 2,400 pounds of soda ash. It is thrown into the stream and passes down the creek. This waste contains everything belonging to the straw, except the fibre.

Some experiments had been made at Fort Edward to utilize this material for agricultural purposes. Muck was drawn out and the liquid poured upon it, but I am not able to give the result. The liquid, as it passes off to the stream, is too strong to be applied directly to plants—unless it is diluted it kills them.

Another experiment was made under his (Miller's) direction. There was a large pit near the mill, where the knots and dirt blown out of the straw by the fan-mill were piled. Upon this mass the liquid was thrown, and the mixture spread upon sandy land, sown with oats. It was spread over the land like manure, and wherever it was put it killed the oats. In the fall the piece was seeded to grass, and there was a large growth. It was too strong for the oats.

In reference to the value of soda and potash in agriculture, Mr. Miller referred to Johnson's Agricultural Chemistry and quoted his remarks in regard to the value of carbonate of soda and carbonate of potash. According to Johnson, carbonate of soda was worth \$55 per ton for agricultural purposes. It could be applied profitably to grass lands that were mossy, or that contained a superabundance of vegetable matter, also upon sour lands. It could be applied beneficially upon fields of grain or wherever ashes can be profitably used. Wood ashes contain potash; this and soda ash, said Mr. M., have the same essential nature in the arts. In preparing straw for paper we can use potash, but it is too expensive. Johnson says that many experiments show that both are valuable to the agriculturist, but the quantity to be used depends upon the soil and the character of manuring to which it had previously been subjected.

Every farmer knows that in grain grown on lowlands the straw is weak. In this liquid we have not only the silica, but the soda that makes it soluble. The alkalis are the only substances which will render silica soluble. Even if the proportion of the silica in the liquid is small, we have the alkali which makes silica soluble, thus putting it in condition to be available for plants. There are 67 lbs. of silica in 1,500 gallons of the liquid. Every plant needs soda and silica, and it must be presented in a form that is available. Johnson says that soda ash may take the place of potash, and that carbonate of soda has been found of benefit to the buckwheat crop. The great value of this waste liquid is that it decomposes manures and vegetable substances. By the use of the alkali, they give up those elements necessary for the growth of plants. In other words, it puts land in a ferment, or condition to force forward the rapid growth of plants.

Mr. Miller spoke of the value of silica in the process of vegetation, and said the only way to get it in a form by which it can be used by plants, is through the agency of an alkali of either potash or soda. The whole system of making paper out of straw, was the discovery that it could be dissolved by an alkali. If lands are manured with half-rotted manure, plants do not grow rapidly, but if an alkali be added, the effect on the growth of plants will be very marked. Potash