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THE CANADA FARMER

VOL. I. No. 12.

TORONTO, CANADA, DECEMBER 15, 1869.

NEW SERIES.

The Field.

We Want Better Pastures

During the course of our travels through the summer, in different sections of the country, we have observed that there is much yet to be learned by the majority of farmers on the subject of obtaining and keeping up an abundance of grass in what are usually called pasture fields. The common rule of seeding down with a mixture of timothy and clover, and a scant amount of seed to the acre even at the best, then cutting two or three crops of hay, and afterwards leaving the land to be devoted to the pasturage of stock for some years more, may do very well with the common run of farmers, who generally have more land than they have capital either to stock or cultivate properly.

But the matter of stock raising is one that demands a little more attention than has been usually given to it, and in no way can it be made more profitable than by devoting some attention firstly to the procuring of choice breeds of animals to begin with, and secondly, to furnishing them with rich and succulent pastures on which to feed during the summer, such as will keep them in thrifty growing condition all the time, for let it be known that unless an animal is kept in a constant state of progressiveness from birth to maturity every day of its life, it is but a waste of time and labour to attempt to raise stock at all.

Among first class breeders of stock, one of the first objects aimed at in carrying on the cultivation of their farms is that of obtaining a constant supply of thick succulent pasturage during the whole season of grass growth, say from April to December.

The first point necessary to be looked to is to get the land into good heart, and the soil thoroughly mellow and deep. To do this without losing the use of the land, a thick, strong growth of clover makes a good beginning. When the clover has had possession of the soil for two or three years, the roots of the clover plant have thoroughly filled the soil, loosening and mellowing it to a considerable depth, and making it full of material that, on the clover being killed by turning under with the plough, forms, on exposure to air, and decomposition taking place, a great amount of plant food for other grasses. After clover, the land is in good heart for the growth of the finer grasses, the more delicate roots of which can now readily permeate through the finely disintegrated soil.

Now, to get a good stand of grass and a thick sward, we must have a greater variety of grasses than it has yet been the practice to grow in Canada.

Timothy, though unexceptionable for seeding down lands that are to be cut for hay, is by no means so desirable a grass for pasturage. It is a strong grower, with coarse bulbous roots that grow near the surface in small thick tussocks, and allow no other grasses to even fill up the intervening spaces with any degree of success; and besides, it is a grass that, from the conformation of its roots, and habit of growth, is not adapted to do more than give a single heavy growth of leaves and stalks up to the time of seeding, after which its roots seem to require rest, and to be incapable of giving a good growth of aftermath; this makes it undesirable as a pasture grass.

We want some of those grasses that have a habit of spreading through the soil by creeping roots, that give a thick growth of leaves, which are constantly being renewed as they are eaten down by stock.

Among the most desirable of these are Orchard grass, sometimes called Cocksfoot (*Dactylis glomerata*), Italian Rye grass (*Lolium Italicum*), Meadow Fescue (*Festuca pratensis*), Oat Grass (*Arrhenatherum avenaceum*), Red-top (*Agrostis vulgaris*), and for soils that have a tendency to retain moisture, especially rich alluvial flats, there is nothing equal to Rib grass, a rather broad-leaved grass which gives a large amount of succulent food that is greatly relished by stock.

There are many other grasses that could be introduced to advantage in a permanent pasture, but we have yet no certain knowledge of their respective merits as regards Canada. In any case, the best plan is to give a liberal supply of seed, and rely on clover to fill out the land for the first year or two, by giving a proportion of clover seed, and as the plants get run out, the other more permanent grasses will fill up the soil.

We have a word to say to our agricultural societies in this matter. As is perhaps pretty well known, our great stock-breeders import their own grass seeds from Britain rather than depend on the mercy of the few seedsmen we have, who, if they do condescend to import any of the best grass seeds from Britain, charge a most exorbitant price therefor, something like 200 to 500 per cent. over cost, which of itself is a great prohibition to the general introduction of new varieties of grasses. Our agricultural societies might do a good service by taking up the matter, and importing largely of grass seeds, at a cost to the farmers of so trifling an amount in comparison with what the seedsmen charge that a great impetus might be given to the introduction of a better system of establishing permanent pastures. Some of our large stock-breeders have already tried several British grasses in seeding their pastures with great ad-

vantage, but they prefer to import their grass seeds from year to year, as required, from the best English houses in the trade, rather than grow any themselves, for they have no land nor time to spare in growing a few bushels of seed, when they can buy to much more advantage in Britain. The average cost of the best grass seed in Britain seldom goes beyond 1s. to 1s. 6d. sterling per pound at retail, and for our dealers to charge 75c. to \$1 per pound for the same seed is simply prohibitory.

Drying Hay and Grain by Artificial Means.

In our last issue we published extracts from a letter which had been written by Mr. Robert Neilson, of Halewood, Liverpool, England, on this subject. It is a very interesting one, and will bear further discussion, not so much because it is likely to be much used in Canada, as because it opens a new field for enquiry in agricultural matters. We all know that when hay is put together in the stack in too green or too wet a state it will heat greatly, and in some cases burn or char all the centre of the stack black. Most of our old country readers will recollect hayricks in this state, which shows so plainly when the stack is cut down in halves by the cutting knife used for that purpose in the old country. All must have remarked, too, that the outside portions of such ricks are perfectly good. It used to be said that when the hay was not actually reduced to charcoal or a cinder that it was excellent food for fattening cattle. When the dampness has not been sufficient to cause this combustion, but has been too great, the hay is mouldy and dusty, but it is always dry.

All prudent farmers in England, in a damp or catching time construct their ricks and stacks, and even the mows in the barn, with one or more chimney holes made by embedding a large basket—here called a "Willy"—in the stack, building the hay in tight round it, and lifting it as often as the hay came near the top. Others use large sacks stuffed with straw to make the holes or chimneys, as Mr. Neilson did, and where these precautions were taken the stacks and mows were considered as safe from over-heating.

It is, therefore, clear that there is a point up to which the natural heating of the hay, straw, &c., is of good service, and is most useful in drying the hay, &c. Beyond that point, over-dampness produces mischief. If, therefore, in packing wet or green wheat-sheaves into the stack or barn, care is taken to leave interstices between the sheaves by packing them across in several places so as to leave chimneys, no harm would happen from over-heating, particularly if in building the stack or mow proper channels were left at the bottom to these chimneys so as to ensure a good supply of air below. The heated

air in the chimneys would then rise, and be replaced by the fresh air coming in under and through the passages left for that purpose, and a thorough ventilation would be secured.

The same principle is made use of in the storing of grain in large elevators—the grain becomes slightly warm, and considerable evaporation takes place—the bins of grain are at this point let down through the spouts to the elevating machinery and elevated, and a new bin filled. By the time this is accomplished another bin is ready to be operated upon, and thus the entire grain is dried with its own natural heat, and finally rendered fit for shipment, while the same grain, if shipped before this process had taken place, would have been totally spoiled. Everything put together in large masses heats more or less, and in hay, &c., this natural phenomenon can, with judgment, be turned to a most useful account.

Experiments with Superphosphate of Lime.

Mr. Lyman Call, of East Durham, sends a short account of some experiments with superphosphate of lime on various crops. He applied this manure to portions of a field of potatoes, leaving rows unmanured to note the difference. The quantity used was about one barrel to an acre, and it was applied in the hills, about a table-spoonful to each hill. The manured portion exhibited a marked superiority over the other in vigour of stalk during the period of growth, and at harvest yielded one-third more than the unmanured rows. In experimenting with the same fertilizer on meadows, he comes to the conclusion that a barrel of superphosphate will increase the hay crop by as much as a ton to the acre. On wheat he found less marked advantages, and believes that salt is preferable in this case, using about two and a half bushels of salt to the acre.

Early Rose Rotting.

(To the Editor.)

SIR,—A great deal has appeared in the public papers, in those devoted to general news as well as those confined to agriculture, and cognate topics, concerning the good quality and great productiveness of the Early Rose potato. It is therefore all the more necessary that information of a different character concerning the new variety should not be withheld. It has not appeared from any public statement which I have seen that this potato was liable to rot. My experience, therefore, as it bears on this point, may not be without value. I planted this spring four pounds of these potatoes, which I treated in all respects the same as some Early Goodrich planted alongside of them. When taken up about a month ago, I roughly estimated the quantity at four bushels, and on trial

found them to be of first rate quality. The Early Goodrich yielded, I thought, a little better, but were not so good in quality. When first dug I found a very few rotten ones amongst the Early Rose, which were left on the ground, and only those apparently sound were put in the cellar, on a large shelf, spread out so that they were not more than six inches deep. After a time I discovered that there were more showing signs of rotting, and about a week since I had them picked over, when there were about three bushels found to be more or less decayed and putrid. The Early Goodrich were not taken up till some time after the Early Rose; more were found to be rotten at the time of digging, but fewer have decayed in the cellar. Both varieties have rotted much worse than the Garnet Chili. Indeed, I cannot say that I have seen a single one of that variety rotten out of about ten bushels.

To those who may be desirous of trying their luck in an attempt to produce new and improved varieties from the seed, it may be of use to know that very nice plants may often be found in the spring on ground where potatoes have dropped their seed-balls the previous fall, and that these can readily be transplanted. I have this season raised from such plants a number of potatoes three inches in length, and a few even larger. Some were allowed to remain between the rows of field carrots, where they came up, and even under these unfavourable conditions produced tubers of a fair size.

W. O. K.

Whitby, Oct. 21, 1869.

Frosty Lands.

One of the greatest peculiarities about Canadian lands is the liability to local frosts, and these frosts are so exceedingly local as to be puzzling in the extreme. If a farm, after being cleared up, proves to be frosty, the sooner the owner sells it and goes to another, the better. It may, and most likely will, amend in a few years, but in the meantime the owner will have spent and wasted time on it to a poor purpose, which, if spent on a good place, would pay for the freehold. It is doubtless hard for any man, after he has gone through the hard labour of clearing up a place, to abandon it; but he had better do so than remain, if it proves to be frosty.

There are many reasons given for this scourge, and an endless diversity of opinion, but all agree that the only profitable use which can be made of a frosty place is to get it down into pasture, and depend on the dairy and grazing for returns.

Some persons blame the black mucky soil which is so predominant in some places; others say that it is owing to the place being too flat and level and in the neighbourhood of swamps. But whatever the reason is, it is clear that it is only a matter of one or two degrees of heat by the thermometer which makes the difference between a place that is frosty and one that is not. Perhaps the most

rational reason to give is, that from wet and low-lying land a greater amount of water is evaporated than from other land, and this evaporation produces the cold so much dreaded; but against this it may be said that from the dryer land (being warmer) the evaporation is greater, and therefore should produce greater cold. Then again, the black muck, from its colour, ought, during the day, to absorb a greater amount of heat from the sun's rays than lighter coloured land, and this heat so absorbed during the day ought, one would think, to keep the land from freezing during the night; but this is not so, for it is this very black soil that is the worst affected, and it is well known that the same soil, after a few years' ploughing, and when the stumps have all been taken out and the clay has been brought to the surface, will lose its frosty character altogether, and become productive. It is a very curious and perplexing question, and one which deserves research both by the farmer and by the philosopher.

Every observer must have noticed that during the first frosts certain portions of the country seem to be free, whilst the vegetation in other portions is entirely cut off. In travelling from Toronto to Hamilton this has often been observed; every now and then half a mile or a mile of country will be black with frost, and the intermediate portions scarcely touched. It seems as if the frost winds came in strips, and every now and then struck and clung to the earth, whilst other parts had the power of resistance. Every one you talk to has a different opinion and theory on the subject; all seem reasonable at the time, but there is great doubt whether any are absolutely right, although the wetness of the land is probably the principal cause, and points to draining as the remedy.

VECTIS.

Preservation of Roots and Green Food.

The following, which we clip from the journal of the New York State Agricultural Society, opens a wide field for Canadian farmers. Winter food for cattle cannot be too highly recommended, if cows are to be kept in milk, and sheep are to do well, and if we can, as indicated in the following article, find a method by which mangolds can be preserved, the boon will be great to all. The only objection to mangolds is their tenderness to frost, and their injury, and indeed the destruction of their valuable properties, by heating and malting, as it were, by growth. Mangolds, as a food for cows, yield excellent milk and butter, and are far superior to any kind of turnips if taken at their best; but they rapidly deteriorate from many causes, and then fall below turnips in their useful effects. If on trial the plan recommended is found to answer, it will add one more to the farmer's winter resources. The following is the article alluded to:—

"We have seen that M. Leduc employs steam for the preservation of beetroot, but this

method preserves it only for a certain period. We know how difficult it is to preserve beetroot beyond the month of April, and how much it loses every day both in weight and quality when spring makes the plant vegetate. M. Leduc was compelled to use his beetroot in six months, and fatten up an inconvenient number of cattle. Thus the preservation of this root was of great interest to M. Leduc, since it would enable him to keep it for a whole year. Well, this plan has been discovered. Having succeeded on a small scale, it has been tried on a large scale at Beaufort. It has been stated by a certain number of persons that beet cut on the 6th day, and preserved in a certain manner, was kept in a state of great preservation. These beets were eaten with great eagerness by the cattle. It appears that this food would be quite as good next year. The following is the plan adopted: The beet was cut and mixed with straw—nine kilogrammes* of beet for one kilogramme of straw. The whole was put in a ditch of brickwork or in a square trough, and put into the ground, not too moist, however. The food should be pressed very closely, in order to make it ferment equally. The ditch, once full, should be covered with twenty-five centimetres† of earth. At the end of six days' fermentation will have begun, and will last about ten days. During this the beet deprived of air is in a bath of steam, which gives it a piquant taste and preserves it thoroughly. M. Leduc writes the following: "When I was persuaded that the food cut on the 6th May was perfectly good, and would keep a long time, I decided on making provision for the next year, but I determined on making a new experiment. This took place 1st September, 1859, with 850 kilogrammes of beet cut down. The 19th October, I opened the ditch, and found the food would preserve as long as that cut on the 6th May. I had made this experiment because the beetroot cut in May had fermented in a mass, and I feared that which I cut in November would ferment too soon, and would not keep so well. This new experiment makes me work with all certainty of success.

"As M. Leduc hesitates no longer, at the end of October he cut down 200,000 kilogrammes of beetroot, which, mixed with wheat straw and straw of colza, have been placed in a heap measuring nearly twelve metres long, twelve broad, and three deep, and containing about 430 cubic metres of food. The beetroot was heaped in this large reservoir, then covered over with thirty-five centimetres of earth. In five days fermentation began; the beetroot, deprived of air, was kept in a bath of alcoholic steam, by degrees fermentation ceased, and when we opened the ditch on the 7th December, there was a strong odour of alcohol. Given to the

* A kilogramme is equivalent to 2 lbs. 5½ drachms avoirdupois.

† A centimetre is equal to 39-100ths of an inch. 25 centimetres will therefore amount to 975 100ths, or a little over 9 inches.

animals, they ate it with eagerness. In these conditions the fermentation of the saccharine matter of the beet began; owing to the small quantity of air in the mass, and particularly in the straw dividing it, fermentation having absorbed this air, continued, and then terminated without any symptom of putrefaction. The carbonic acid in the heap must have been caused by the air. We can safely affirm that beetroot cut and fermented will afford for cattle the cheapest and most abundant food, and will be of great value to our farmers. Now, in what way does the use of beetroot present the most advantage? Should he extract the pulp, or should he use it entirely? That is a question intimately connected with the circumstances of the farmer, and he must discover which can be done with the greatest ease. But in all cases it will be an evident advantage for the small farmer to prepare the necessary food for the cattle economically to last the year. There will be an advantage also for the farmer who wishes to fatten a number of cattle to produce a quantity of manure."

While on this subject, we may mention another plan which seems to be increasing in use on the continent of Europe, namely, the preservation of green Indian corn stalks for winter cattle feed. The information was taken from a foreign publication, and the translation seemed to be imperfect, but the hints and suggestions may be useful, and lead to a successful experiment. A pit is prepared in the ground in a dry place, well drained to prevent the accumulation of water, and the bottom and sides boarded, or wattled so as to keep out the earth and keep the food clean. The entire stalks of green corn, leaves and all, are then laid close together, either across or lengthwise of the pit, and as soon as a depth of six inches is attained, salt is strewn over it, then another layer of the cornstalks is added, then more salt, and so on until the pit is filled. Boards are placed on the surface, and earth on the boards, until sufficient is laid on to exclude the air. The entire mass heats, and works itself into a rich vinous smelling food, which is (when ready in the winter) cut out with spades, and fed to the cattle, and of which they are immoderately fond. It is stated to be very wholesome and fattening, and not to affect the milk of cows with any disagreeable flavour. The thing is well recommended, and is worthy of a trial. Would not green clover do as well as Indian corn stalks?

VECTIS.

THE GARNET CHILI.—Mr. George Badger, of Caradoc, gives an account of his experience with this variety of potato during the last season. He obtained a yield of 87½ lbs. from two tubers weighing together less than a pound. The ground was not in favourable condition, being tough blue grass sod, and, owing to the wet season, it was found impossible to keep the grass down.

Experiments With Thick and Thin-sown Clover.

There has, of late, been much controversy as to the quantity of clover seed advisable to sow on an acre. In a former communication I mentioned my experience of the growth of self-sown clover seed, and called the attention of my brother farmers to the fact, that the failure of clover seed to produce thick seeding was not altogether necessarily due to the insufficient quantity of seed sown, but might be attributable as much to the bad quality of the seed. In support of this theory, early in May this year, I seeded something over fifty acres with timothy and clover. The quantity sown was, 3 lbs. of broad 1 lb. of alsike, and 3 lbs. of timothy to the acre. On the 1st of October I carefully examined the result, and found the ground literally covered with clover plants, the growth of which was about six inches in height. The crop seeded was barley, and the produce not a heavy one in grain, but plenty of straw—in fact, too much so. Some months since, in one of the numbers of the CANADA FARMER, there was a correspondent who then stated, that 10 lbs. to the acre would pay better than 3 lbs., and some of the English periodicals advocated as much, if not more.

My experimental trial most satisfactorily proves that anything over 3 lbs. of broad, and one pound of alsike, is altogether unnecessary, provided it all grows. The timothy sown has not yet attained much growth, as it does not usually show so much as the clover in autumn; but the clover alone is as thick as a mat, and when timothy is added to it, as it will be next spring, it will be quite as thick as there is any possibility for growth to take place. Now, all this goes far to show, that the seed sown as above was abundant in quantity, and also that the quality was good, and probably all the seed grew. Ten or fifteen pounds per acre of clover seed at \$7 a bushel, costs about \$1.25 to \$1.75 per acre, for seed alone; and poor seed that requires ten to fifteen pounds per acre to produce a crop, when half the quantity of good seed is equally efficient, is rather a costly piece of deception, especially where, as in my case, there are from forty to fifty acres sown. The fact is that the late stir amongst the seed dealers in England explains much that we did not understand before. In the revelations lately made on this subject many respectable seed dealers fully exposed the "tricks of the trade," and publicly stated that others used "killed" seed of similar appearance, but cheaper in price, for the purpose of enlarging the bulk and weight of the good seed, mixed through the worthless. These hints are valuable to us farmers, and we ought to fully endorse any action taken that most effectually puts down such nefarious traffic. In the records alluded to there were many kinds, such as cabbage and cauliflower seed, worth, by the ounce, ten times as much as the rape and turnip with which they were mixed. It is

true that all these seeds were said to have been "killed" before mixing, so that none of them would vegetate, and some credit was taken for this act of generosity and magnanimity; with little reason, so far as I can see, as, of course, if any one who sowed cauliflower seed reaped turnip, the deception would be too apparent. I am not prepared to show what seed, if any, is used to adulterate clover; but I am prepared to prove that any quantity over three pounds of broad and one pound of alsike and three pounds of timothy, provided it all grows, is wasted; and the want of good seed or good management causes the waste, from a poor crop, of a vast quantity of land sown with the above grasses, and the consequent disappointment attending on failure. Another cause of loss of crop may be the imperfect way in which sowing is completed, and any correspondent who will enlighten us on the subject, and show, practically, how and where the remedy for this lies, will most certainly deserve thanks at our hands, and I, for one, will cheerfully render my mite of praise.

My experience goes far to show, that if clover seed is harrowed in with the crop sown with it, many of the seeds are buried too deep ever to see daylight again; whereas the opposite course, that of sowing on the surface of dry soil in spring about seeding time, and not covering the seed at all, causes much to perish when it sprouts on the surface, and before the roots are old enough to protect the young plant from the scorching sun. This year, of course, was an exceptional one for moisture, and might induce growth of seed which in other years would vegetate only to perish, if uncovered. Whether seed sown one way or another is capable of producing a fall crop is one point; but this by no means proves that if a better arrangement of seeding were practised, that seed now found to fail may not, by such improved mode of covering it, be much more likely to succeed than that sown in the ordinary way. I am not anxious to blame where blame is not due, but I am anxious to investigate the cause of such continued failure of clover to produce a thick handsome mat of grass the first autumn, or at least to know that all the seed is good and that the fault lies in other causes.

NOTE BY ED.—Some further light would have been thrown on the matter if "C" had told us what kind of soil he has and what degree of culture it was in. Clover does better sown on barley than any other crop, if not sown too early; but many farmers seed down on winter wheat after a thorough cleaning of the soil by a summer fallow, and fail to get a stand, we think, mainly from too thin sowing on a soil not in a state to give the young clover plants a fair chance to grow.

Bales of prairie grass are to be sent to England from the United States for the purpose of testing by experiment its value as paper material.

Experiments with Varieties of Oats.

Some interesting experiments with new varieties of oats have been made during the past season, on the farm of the Michigan State Agricultural College. Among the results reported, it is curious to note that in all the instances of foreign grain, the weight of the produce deteriorated in comparison with the seed. For example, in the Excelsior oats, a new variety imported from England, the seed sown weighed at the rate of 47 lbs. to the bushel, while the oats raised weighed 35 lbs. to the bushel. The Somerset oats, another English variety, weighed 44 lbs. to the bushel, the produce only 31 lbs. per bushel. Similar results are reported with varieties from Hamburg and Prince Edward's Island; while in the case of seed from Michigan, the weight, per bushel, of the produce exceeded that of the seed. The yields, nevertheless, are, in some cases, estimated extremely high; but it must be remembered that the area sown with each variety was very small, and a larger breadth, with perhaps less careful cultivation, would not have yielded up to the mark of the experimental patch.

The following is a brief summary of the results. Excelsior oats, from England, yielded at the rate of 60 bushels to the acre; Somerset oats, from England, 91 bushels to the acre; White Schonen oats, from Hamburg, 62 bushels to the acre; Black Swedish, also from Hamburg, 66 bushels an acre; Prince Edward Island oats, 62 bushels per acre; Brooks' oats, from Michigan, 68 bushels per acre; Norway oats, (the seed from Jones and Clark, New York) yielded 50 bushels; and the Surprise oats, at the rate of 38 bushels to the acre. The weight of the Norway oats was only 28 lbs. to the bushel, while the same measure of the last named variety weighed 46½ lbs.

Making Underdrains.

The winter is the time to do this work, when labour is plenty and cheap. Men who formerly spent the best part of the winter in clearing land or chopping cordwood, should, now that there is so little of that kind of work to do, be only too glad to work at ditching for moderate wages. The days are short, and if they put as much energy into the work of ditching, as they do in chopping, they need not work over six hours a day, and yet perform a good deal of work in a pleasanter manner than they could do in hot summer weather.

Joseph Harris has been trying the experiment last winter, on his farm near Rochester, and finds it quite successful. The line of the drain is marked out by stakes in the fall, and the first part of the work done before the ground freezes hard, by running a plough along the line of the drain, turning a furrow each way

the width of the drain at the top. After throwing out the soil by going back and forth in the furrows as long as the plough will turn out the soil, the trench plough is brought into requisition, four horses put on, and the soil loosened as deeply as it can be. This loose soil will get covered with snow at the first snow fall. The snow acts as a protector to keep it from freezing hard, and when the ditchers go to work they find but a thin crust of frozen earth, through which their spades readily penetrate, and, as they work from one end, they complete the drain to the bottom, lay the tiles, and cover as they go along. The tiles can be drawn on the land either late in the fall or with the first sleighing. The soil will be found much drier and better to work in than during the wet season of late fall or early spring.

As frost never penetrates over about two feet, and seldom that, if the soil is such as to require draining, water will appear at the depth at which the tiles are to be laid, in sufficient quantity to enable the tile layers to regulate their work so as to give sufficient fall, which is known by the water passing away through each tile as it is laid. This part of the business is the most important, and should be superintended either by the farmer himself or a person who competently understands the *modus operandi* of draining, for it is of special importance that it be done correctly, otherwise the drains will not work, and the expense of re-opening them would be a serious item.

Draining with Wood instead of Tiles.

In one of my rambles through the country to ascertain the progress of agriculture, I came on a very large section where many farmers were engaged in draining their farms more or less with wooden drains. The land all through that section was generally level or flat, and from the unsatisfactory result of trials with drain tiles, draining with wood has been much practised, and was more generally liked, and was stated to be cheaper. I found that people were constructing drains made of a piece of common pine or hemlock board, six inches wide, and one of seven inches wide, tacked slightly together in the form of an inverted letter V, and placed in the trench dug to receive it; by this course it follows that there was no bottom to the drain, nor was any required; the ditch was dug wide enough to receive the inverted right-angled drain-box, the joints were sawed off square, and if not close enough, a piece of board or chip was placed over the opening or crack where the butts of the drain-boxes met. Generally however, this was quite unnecessary, as a

piece of sod was always laid over the joint, and the clay would never pass through the opening in quantities sufficient to produce injury. No perceptible wash at the bottom of the drain was complained of, probably attributable to the clayey subsoil not being liable to wash. The area of such a drain was far in excess of any tile at the same price, and the difficulty of two-inch tiles passing each other a little at the points of contact at the ends, and thereby filling up, was altogether avoided. Some saw mills in the vicinity were cutting drain stuff altogether, and the demand exceeded the supply. Some of the most sensible farmers were busily engaged in partially draining their farms—that is, they were running drains through all the low spots, thus leaving the field as dry in the low as the high parts. When asked why they did not thoroughly drain each field land by land, as they went on, instead of only draining the low, wet portions, I was told that to do this would cost at least \$16 to \$20 per acre, and would never pay, while many even denied the advisability of so doing. They argued that during our parching summers the dry land did not require draining, provided the wet portions were well relieved from surface and surplus water during the wet season, and I have no doubt practical facts were in favour of such an argument. Agriculture is so uncertain, from the ravages of the midge, that great outlays of this nature would often be ruinous, and farmers in Canada are not always blessed with too much capital. Many, very many, have plenty, and money to loan, even after buying farms for their sons; but where a man goes on a farm late in life, and pays for it and for buildings, live and dead stock, and settles each of his sons on land of their own, he has not usually money to use in draining so very extensively, in order that some one coming after him may reap the benefit; whereas, the partial relief of such draining as I have seen done and described above, yields an immediate return for the outlay. The land is relieved of stagnant water at the time most needed, and in consequence becomes greatly improved, and at small cost in comparison with that which would be incurred in draining the whole farm, as often advised and practised in England. One, and by no means the least, benefit derived, is that frost does not so often affect the growing crop. I have often seen frost lying thick on these low spots in a field when the higher portions were quite exempt. C.

Mole Draining.

This is a class of draining but little understood by Canadian farmers. It is accomplished by an iron cone being dragged through the earth at the depth of ordinary drains in which tiles are used; but it differs from tile drains in the pressure of the cone passing through the earth consolidating the sides of the hole which it leaves in its pas-

sage, and thus forming a hardened mass which answers the purpose of the tile, and keeps in repair for many years. There are drains of this kind to be found all through the clay lands of Ohio, many of which have been running for fifteen years, and are still in a good state, and answering the end for which they were originally intended.

The draining instrument is made as follows: First, there is a strong frame, either angular or square, which in the old English fashion, is made to run on wheels of a small diameter, but which, from the slow rate at which it moves, might as well be made with runners, instead of wheels, its only object being to regulate the depth to which the mole or plough part is allowed to go. There are strong handles fitted to this frame, so as to enable the attendants to move it, and the whole affair is made of stout timbers, or iron, and is of great strength and solidity. In the centre piece is a strong mortice, through which passes the coulter of the mole iron, and to the front of the frame the chain or wire rope by which it is dragged is attached by a very strong clevis and connecting bolt. All is made of the greatest strength, and calculated to bear an enormous strain. The coulter of the mole is a bar or rather plate of steel, from six to eight inches wide, and one inch thick, at the lower end of which is fastened the "mole," which is a conical piece of iron pointed with a steel point, and sufficiently steeled to resist wear. This is rivetted on in the strongest manner to the cutter, and consists of two or three pieces, the first calculated to make a hole of from three to four inches in diameter, supplemented by others which are affixed by a strong screw and nut, and which when required will leave a hole of six inches in diameter. This is the largest bore which is used, and this is only used where required to carry a heavy volume of water, the smaller ones being sufficient for the lateral drains. Of course, all these drains are made as level and with as little fall as possible, the smaller irons being sufficient for the lateral drains. The mole centre is moveable, and by a rack and pinion, or by notches and wedges, can be set at any depth down to three feet or more. A very strong chain or wire rope is affixed to the clevis at the head end of the machine, and this rope or chain is operated by a powerful crab or windlass, strongly anchored at the extreme length of the chain, and turned by a bar, to which is attached a span of horses, or oxen.

To commence the work, a hole is excavated at or near the intended outlet, to the depth to which the drain is designed to be made, and the machine is placed over the hole, with the coulter and mole going down into it. The strain is then put on the chain, by turning the windlass or crab, and the mole and coulter are dragged through the ground with almost irresistible force, leaving a clean pressed hole and a clean cut slit leading down to it. This fissure made by the coulter is little more than a fine knife

cut, which readily closes spontaneously, so that in a short time nothing is seen to indicate the course of the tube underground. The line of the drain is, of course, so regulated in regard to fall as to carry off the water. In clay land, or in any land that does not "wash," nothing farther than this is necessary, and when you have gone over the field at the proper distances, the place is well and thoroughly drained, but in land that does "wash," or in sandy or gravelly places, it is customary to string on a number of ordinary round draining tiles to a rope passing through them, and attached to the broad end of the mole, adding more pipes as the mole proceeds, until the drain is properly laid. This saves the excavation and filling in, and the injury done to meadow land by the removal and replacement of the turf, always a troublesome and expensive process. In an article like the present, where the writer is necessarily limited in space, the entire operation cannot be so minutely described as is desirable; but in case any readers or correspondents wish to get this most useful implement, the writer will feel pleasure in affording the most extended information. This instrument has not hitherto been manufactured in Canada, but it is extensively manufactured and used in the United States, and it would be much better, until the demand for such a tool increases sufficiently to tempt our manufacturers to take the matter into their own hands, to pay the duty on the foreign manufacture than to go without it. The immediate attention of the writer was called to the mole drainer by seeing a circular from Messrs. Doty & Co., of Springfield, Ohio, who with the enlarged views of American manufacturers, think no expense wasted which is incurred in advertising, and in making their various manufactures known, and to which enterprising firm the agricultural department of the *GLOBE* and the *CANADA FARMER*, with its 40,000 readers, would afford an excellent medium for making the Canadian public acquainted with their various useful and important wares. In carrying out my enquiries on this subject, I happened to meet with Mr. Romain, the originator of the steam plough, now so extensively used in England and throughout the world (and whom, by the bye, we may be proud of as a Canadian or an adopted son of Canada). We talked the matter over together. He has seen the mole drainer used in almost every kind of soil in England, and says that too much value cannot be set upon it. Now if, in England, where labour is so cheap, this drainer is used with advantage, how much more so could it be used in Canada, where labour is from twice to three times dearer than in England, and where draining is even more important than in England; for in Canada draining means "early maturity" of crops, and early maturity means a good crop of fall wheat, free from the midge; and the latter, as all our farmers know so well, means success and growing rich from farming.

VECTIS.

Building a Root House.

There are many localities where it is impossible to have a root house entirely built under ground, in the side of a hill, or similarly situated advantageous locality. To those who contemplate building on level land, I will relate the plan I had an opportunity of assisting at and seeing carried out in one of my wanderings. An acquaintance of mine had been much troubled with potato and turnip pits, and determined to effect some radical change, and knowing me well, and also knowing that I had some experience in the building of root houses, he begged me, when calling on him, to prolong my visit for ten days, whilst he and his sons, with my superintendance, constructed a root house.

We first carefully examined the land, and found that we might place the floor of the building at least two feet below the outside level, without any danger of water being troublesome. We therefore commenced to excavate, and dug out an oblong cellar of two feet deep, and thirty by twenty feet long and wide; the earth was readily thrown out, and raised quite a formidable mound all round the pit; we then took three inch hemlock plank, twelve and fourteen inch wide, (pine would have done quite as well, or better, but hemlock was cheaper), and dug out the foundations all round fourteen inches below the bottom of the cellar, and laid the first course of the wall, by carefully dovetailing and fitting the planks into each other at the corners, and placing them on edge as a foundation, and then filling in on the inside and outside with small gravel stones about as large as small eggs and walnuts: this is most important, as otherwise the rats will utterly destroy the root house for all dairy purposes.

As I knew my friend was going to build a root house, and wanted it to last many years, I had previously sent by rail a barrel of coal tar, at a cost of two dollars for the tar and one for the barrel at the works in Toronto. Before finally laying our foundation, we heated some of the tar in a sugar kettle until it was quite liquid and almost boiling, and with an old broom thoroughly saturated the tops and bottoms, sides, ends, and edges of the foundation planks, and rammed the gravel well down on both sides until it was as solid as a rock, and the planks quite straight and level. We proceeded to build up tier after tier of plank, with two or more joists in each plank, about six feet apart, to keep them all straight and true. We had the wall completed before next night, as planks twelve to fourteen inches wide and all gauged to even sizes, went up very fast. We now only tarred the edges and back, and not the inside or front as we went on, on account of the more cleanly working amongst such black stuff.

We built up the walls eight feet high, and in the upper planks we cut "gains" 3 x 10, for our ceiling joists; these were heavy and

strong, as will be seen by and by were required. We "shouldered" our joist about one and a half inches, to afford support to the outside wall from outward pressure, carefully farring every portion that was exposed, all but the bottom and sides of the ceiling joists, as these were inside. We then thoroughly tarred some two inch plank all over, sides, edges, and ends, and laid a strong floor over the ceiling joist, and when the floor was cut out, and a similar place built up for a passage way, and all thoroughly tarred as we went along, we had as handsome a root house, so far, as you would desire to see. We now continued the wall about three feet high above the floor, and put on the roof in the ordinary way, leaving room in the end to drive a team up an incline into and over the root house. We then carefully banked up the excavated earth, and well sodded the mound so made at the sides, with sods, and built the sods about one foot above the ceiling joists. The roof was allowed to project but a few inches, as the water that fell from it and was allowed to percolate through the turf and through the clay that composed the mound at the sides, would most materially assist in keeping the timber from decay, by always keeping it wet. When the roof was completed, we constructed bins along the sides by boarding up stall-like partitions, of about six feet each, up to the ceiling joist. We then took pine rails and cut them so that they would just fill the length of each bin or division, and form a pervious floor. We laid them on cross pieces of rails, so as to raise the floor some little distance from the earth. Over each bin or stall we cut a small hole in the ceiling, nearly close to the wall, so bevelled in the cut, that each piece cut out formed a perfect clap to fill the hole again. We boarded the passage way between the bins, but allowed the air to have free egress from under the door and under the hollow passage way, in such a manner that each bin was fed with air passing under the roots through the rail flooring, and the entrance to each bin from under the floor was fitted with a piece of board to obstruct the air and force it to pass on to those in which the obstructions had been removed, when heating or growth required checking.

We fitted ordinary double doors with six feet of passage way—so that one door could be closed when the other was opened—and we faced the door to the south to avoid cold north winds blowing directly into it. When we hauled the turnips and potatoes we found some difficulty with the earth adhering to them, and I set my brains to work to cure the evil. I constructed a ladder about six feet long and the width of the waggon box, and put the bars so close that potatoes would not go through the interstices. When the team was driven up the inclined plane and into the root house, I so arranged the ladder at the side or end of the waggon box, that when shovelling out the roots they

were all shovelled on to this ladder, and allowed to run down it on to the floor, and into the small trap-door cut in the ceiling over each bin; thus completely screening all earth out of the roots, and leaving them clean and free from soil. Simple as this contrivance was, it was most effectual. The incline at one end for entering the root house with a team answered so well and saved so much labour, that we cut a second door at the farther, or south end, as well as at the north, and thus drove the team through the top of the root house. When cold weather came we calculated to use the upper part for a hay mow, or to cover the floor with a layer of straw and chaff, if we could not succeed in getting sawdust in quantities sufficient. The cost of the root house was not great; it was quickly put up, and experience shows coal tar to be a perfect preservative against decay. The preservative qualities of tar do not seem to rest alone with the gummy substance, as one of the latest improvements in England, in preventing destruction by decay, in timber exposed to the action of the weather, or influence of moisture, is carbolic acid, which is made from coal tar, and can be furnished at such an almost nominal price, as to be well adapted to preserve timber from decay; but coal tar is all that we have to use, and it has also another excellent quality; no rat will attempt to gnaw through a tarred board.

One precaution we found absolutely necessary—we, of course, could not yet plank thirty feet long, and had to use some of twelve feet and sixteen feet. So we butted the short pieces so that the joints came in the centre of the planks above and below, and the use of one and a half inch dowels, made of sound oak, so equalized the strain, that for all practical purposes short plank answered quite as well as long. We also placed diagonal braces on the inside, sloping from the ground to the sides, and firmly butted at the foot, against a piece of cedar, buried in the earth, lengthened to receive the ends of the braces, and these braces formed a portion of the division between the bins.

If we found the roots heating in any one division, we at once removed the damper across the bin below the hollow floor, and also that of the outlet under the door, and a rush of cold air passed under the hollow floor and up through the heating bin of roots and out at the little trap above, and completely cooled and checked growth.

C.

Utilizing Sewage.

Some most interesting experiments in utilizing sewage have been conducted of late years in England. Of these the most successful, perhaps, has been the sewage farm in connection with the camp at Aldershot, naturally a most barren and unpromising locality for farm operations.

In other places where similar experiments have been tried, there has been soil, of a greater or less degree of fertility, to work

upon, and people have naturally considered that only an added degree of fertility was given to it by the application of manure, either liquid or solid; but in the case at Aldershot there was a mere gravel and sandy tract, totally devoid of vegetation (for the patches of heather here and there do not deserve the name of vegetation), and which had conformed in this desert shape from time immemorial. Not only was there absolutely no fertility, but there was in the soil a quantity of those peculiar salts of iron, which are well known to be inimical to the support of vegetable life. A more unpromising spot to make a farm of could not be found, and a more perfect spot for the proof that fertility is dependent on man's will never existed, or was attacked by skill and capital.

The soil (if soil it can be called) consisted of ninety-five per cent. of absolute silica, that is, sand and gravel, stones and flints, three per cent. of protoxide of iron, or in fact, rust from iron ore, (the substance injurious to vegetation), and two per cent. of the vegetable refuse of withered heather; and every one who knows heather at all, knows that the results, from the decay of heather roots, will scarcely support moss. Well, this arid desert plain is now, by the means of sewage water, (that is, liquid manure in a weak form), brought into such a state of exuberant fertility, that six cuts of grass of the most luxuriant nature, can be cut from it annually, and it produces also capital crops of potatoes, turnips, and other green crops, and the experiment will, no doubt, yet be made to produce equally excellent crops of grain.

The sewage water alone is used as a fertilizer, the solid matter, after being thoroughly washed time after time, in the receiving pits, is removed to make room, but it is found to be of very inferior fertilizing power, and is only spread on the ground to get rid of it. Now, what does all this go to prove, to the thinking agriculturist? Here we have gravel and sand, infected with a matter poisonous to vegetable life, actually converted into the most fertile medium, (for soil it is not), for raising crops, and this, not by solids and mineral matters—by humus, decomposed vegetable matter, and all the usual elements of fertility in a soil—but by liquid alone, and that liquid used in as recent a state as possible; for one of the most striking propositions of the whole experiment is, that instead of the liquid manure being allowed to ferment and decay, and thus, as we have always supposed, from its production of ammonia and azotized matters, becoming in the most formable state for manurial purposes; but it must be used fresh, and got on the land before the chief elements of decay are fully eliminated. This is one of the most important facts of the whole, although one which the careful observer will not be unprepared for when he recollects the effect of liquid discharges of cattle on pasture land.

There are now three of these great sewage farms in Britain; there may be more, but

these are the most important. The first, because the oldest, is at Edinburgh, and this has been in operation the best part of a century. There, the chief sewage of the city is conducted over meadow land in the same method as water is laid on to a water meadow, and with the most astonishing results. The produce of these meadows (although of the natural grasses alone) is wonderful, and is cut at least six times a year, and used for green cattle and cow feed for the city. The second is at Barking, at the outfall of the great London system of drainage. This is a modern affair, under six years old, but attended with equal success. The third is at Aldershot. But comparatively little attention was paid to the two first, since it was only an added fertility which was given to the meadows. But at Aldershot, Mr. James Blackburn, the enterprising farmer who undertook the task of utilising the sewage of the camp on the adjacent land, literally took the bull by the horns, and has carried out his scientific principles to the utmost possible extent. Instead of increasing fertility he may be said to have created it; instead of acting on a soil, or land worthy to be called such, he has attacked and converted a desert into a fertile plain.

These experiments have clearly shown that you may take the most barren sand, and by flooding it with the liquid discharges of the city sewers, render it capable of bearing any crop; and by a continuance of the flooding, keep up that fertility to any pitch required. This goes to prove that the entire virtue, or at all events the chief virtue of all our stable and farm-yard manures, consists in the liquid, or rather the soluble portion; or if that has been saved and absorbed by, and dried as it were into the straw, and vegetable fibre, it can by the action of rain or any moisture, be again leached out, and if not protected, will pass off and be lost, or be applied where it is not wanted. What can be a stronger argument for so constructing the farm-yard, stables, and byres as to save every drop of this precious fluid, and then apply it either direct as liquid by the sprinkling cart, to the grass fields, or take it up by absorbents, such as peat, chopped straw, earth, or other matters, and spread it where it is wanted? What can more show the necessity of keeping manure under cover, and free from the action of the elements; particularly from the leaching of the rain, and melting snows; and what can more show the folly of so constructing our manure heaps, as while rotting and destroying the best portions by the escape of the ammoniacal gases, to submit the manure at the same time to the action of the rain to carry away as fluid all that evaporation does not remove in an aeriform shape.

VECTIS.

Wild oats should always be pulled up in the spring, as soon as they show their heads above the wheat. Pull them up, there is no other cure.

Inexpensive Draining.

In one of my autumn rambles through the western part of Canada, I was much struck by the attention to the absolute necessity of draining this wet season has called forth from farmers. I passed through several townships where the land, naturally wet and low, was this year much injured by cattle poaching with their feet. I saw many farms where young clover was all trodden into the holes left by cattle grazing, and on remarking the injury to the owner of one of the farms, he said that he had formerly found the same difficulty, but had great belief that the next season would, like previous ones, remedy the evil to a great extent. He pointed out to my notice the young clover plant green and vigorous at the bottom of the cattle tread. I noticed also, in many places that were quite under water after rain, the young clover plant did not appear to suffer so much as one would expect from such moist treatment. It is quite entertaining to call on our brother farmers and "talk farm" with them, and quite instructive also; and one great evil Canadian farmers suffer from is that they seldom visit each other's homesteads, and hence one great benefit derived from fairs and exhibitions. The women visit enough and to spare, but the men lose much by not doing so. I do not advocate a farmer going to see a neighbour when he is very busy, and it becomes a trial to leave off what he is doing to entertain his visitor, but I do most strongly advocate that interchange of inspection and experience that gives such a zest to our labours. As I said before, there is no lack of women visiting. One house, of rather less than second best quality, at which I chanced to call, was honoured by the presence of no less than seven women, and each had her baby, one having two with her. Now I say that was rather too much of a good thing, and so the owner of the house thought, and so he told me when we walked out to look at the farm. He showed me his draining attempts, and complained much of the insufficient size of two inch tiles on level flat lands. In fact, as he said, the mischief in wet weather was often done to grain crops before the size of the small tile would allow of the escape of the water, unless the drainage was more thorough than merely through the low wet places; yet to do this was as much outlay as he felt justified in making just then. He was then using board drains with much satisfaction; but the land was clay, a kind of soil in which wooden drains were not likely to rot. I can easily see that if wood were used in sandy soil the decay would be rapid and the benefit precarious; but it is quite another case where the land lies flat and wet, and where the wood that composes the drains is never dry. I saw the fact most thoroughly proved in our own garden. Where the soil is quite sandy, the bottom and sides of the drain, that were always wet, were, and still are, quite sound

and likely to remain so, although now laid down five years; but the cover, as it is a square drain, has long since shown signs of decay and dry rot. Many persons who have used boards for drains on clay land, where the air is for the most part excluded, and the boards are always wet, will affirm that the boards will never decay, and I have often noticed city drains that were laid down twenty-five years since, and casually uncovered and exposed, were always sound and good as ever, that is, where the land was of such a nature as to keep them always wet. In the flat western part of Canada, the small tile will not answer, and the large one costs too much, and from the nature of the subsoil, the sole of the drain, when letter A shaped drain is used, made of wood, can be laid down of double the capacity of a tile drain, and at less cost. C.

Potato Digger.

A correspondent from Chelsea, Province of Quebec, sends us an account of a potato digger which he imported from Scotland during the past year, and found to work satisfactorily. The price is high for most Canadian farmers. The account may, nevertheless, be of interest, although the time for such implements, and indeed for nearly all farm implements, is now past. The writer states that this potato digger will dig four acres of potatoes per day, with one man and a span of horses. It was imported from Scotland this season, and proved itself efficient beyond expectation.

The body of the machine is a square frame of wood set on an axle-tree furnished with two driving wheels about four and a half feet in diameter. On the middle of the axle-tree there is a bevel pinion geared with another, driving a small shaft that runs over the end of the framing. On the end of this shaft there is a centre keyed on, from which arms radiate, with small forks at their extremities, long enough to reach to the bottom of the drill. A share is fastened to the side of the frame, bent so as to pass under the potatoes in the drill, and can be lowered to any depth. The revolving arms are also regulated so as to pass over the share without touching it. A movable draught hook in front regulates the depth of work.

In operation the share moves along in the drill under the potatoes; the revolving arms clear all off, leaving none behind, and pitch them against a screen of twine netting suspended opposite, about two feet away from the side of the machine. The potatoes are laid along in a row, and there are none either crushed or cut in any way, and none are left in the ground.

Those who raise a few acres of potatoes will, the writer thinks, find this machine as useful as the reaper or mower. It was imported from Messrs. L. & Co., Shuttlestone, Glasgow, and cost there £14 stg.

Experiments with varieties of Potato.

A correspondent from the neighbourhood of Brampton sends the following memoranda of his experience during the past year, with different varieties of potato. Such careful records of experiments and results are always acceptable, and often furnish important data as a guide to the cultivator. In the subjoined report the mode of cultivation is first given, and, in a tabular form, very convenient for comparison, the results in respect to each variety are noted. In many respects the record is in accordance with accounts from other quarters. Being definite, it is especially valuable:—

Soil rather light loam. Ploughed from sod in spring of 1868 and sowed with peas. Cross-ploughed after peas taken off and ploughed again in the fall. Manured last spring, about fifteen loads to the acre, and ploughed and harrowed. Furrows for seed run with the plough 27 inches apart, and from four to five inches deep. Seed cut into pieces with two or three eyes in each (Early Rose only one eye in a piece). Planted from 20th to 28th May, about a foot apart in the furrows, and covered with the hoe. Ground harrowed down smooth immediately after planting, cross-harrowed about two weeks afterwards, and harrowed again lengthwise after the potatoes were up. Horse-hoe run through twice afterwards. No hand-hoeing or earthing up.

Some of the varieties rotted very badly, and none could be said to be entirely free from the rot.

In the subjoined table the first column gives the names of the several varieties grown, the second the rate of yield of sound potatoes per acre in bushels, ascertained by actual measurement of ground and crop, and the third the amount per acre in bushels of potatoes injured and decayed by rot, according to careful estimation:—

Cuzco	415	8
Harrison	411	11
Gleason	397	4
Early Goodrich.....	385	12,
Calico	302	23
Early Rose	301	43
Garnet Chili	257	45
Peachblow	235	78
Buckeye	197	71
Mercer	133	15
Mixed lot, chiefly cups	126	140
Myatt Ash-leaved Prohibic ..	98	5
Kidney	91	130
Early Handsworth ..	84	6

Since the above was received, another somewhat similar record has reached us from Orillia. This communication is as follows:

I planted fourteen kinds on sandy loam, once ploughed, without manure, previous crop oats.

I tried their qualities for the table in May, before planting, and in October after taking them up, and also weighed an equal number

of hills of each, so as to test their relative productiveness. The first and second columns give the quality, the third column the quantity.

Kinds.	May.	Oct.	Dash.
Buckeye	1	1	20
Maiden's Blush	4	1	23
Wild Mexican	2	1	17
Buckley	2	2	25
Meshannock	2	1	12
White Garnet Chili....	3	2	12
Red Garnet Chili....	4	2	20
Banff Cup	1	1	22
Black Diamond.....	4	2	29
Early Goodrich.....	3	2	26
Cuzco	5	4	23
Harrison	4	2	23
Calico.....	4	2	

The Early Rose under this treatment, or want of care, produced sixty pounds to each pound planted, and from one middle-sized potato of the Gleason variety, cut into eyes, I dug sixty-one pounds.

No rot observed, except in a very few potatoes of Meshannock, Mexican, Buckeye, Early Goodrich and Early Rose.

With manure, the relative quality and productiveness of some kinds would possibly have been different.

Of the above varieties the best late appear to be in the order named, Banff Cups (or Rough-skinned Cups), Carters or Buckeyes, Meshannock, Mexican, Buckleys. The best early, Early Rose, Early Goodrich, Buckley, Mexican, Black Diamond.

The most productive Gleason, Buckleys, Early Rose, Harrison, Cuzco, Maiden's Blush, Banff Cups, Red Garnet Chili, Buckeyes, Early Goodrich, Black Diamond, Mexican.

The conclusion I have arrived at is that a perfect potato has yet to be found. By perfection I mean best in quality at all times, most productive, of good form and size, and not liable to disease. The Buckeye, or Carter, would come pretty near it, but for the hollow heart.

Beet Sugar in Illinois.

A succession of disasters and disappointments has attended the experiment of making sugar from beets, which has now been for several years carried on at Chatsworth, Illinois. The originators of the enterprise were Germans, and failed in their first attempts by not adapting their operations to the conditions of the new country. They were, moreover, it is asserted, possessed of more capital than practical knowledge of the business, and expended their means without judgment. The concern was next taken up by a company of enterprising men in Springfield, who invested large sums, and employed new superintendents. Notwithstanding the new energy thus evoked, the results of last year's operations were not remunerative. At the commencement of the present year, the proprietors started afresh

with new vigour and sanguine anticipations. With good seed obtained from Germany at a cost of ten cents a pound, 750 acres of beets were planted. But when the plants were finely above ground, a remarkably violent rain set in, doing immense damage. This vast breadth of beets, on a soft and mellow soil, was flooded with water from three to twelve inches deep, and as a consequence, the top soil moved and shifted badly, drowning the young beets in mud, and fully five hundred acres were totally destroyed. They have now only about two hundred acres, and these, as may be supposed, will yield no more than half a crop.

The lack of water has been another great difficulty which has hampered the enterprise. Last year operations were commenced for boring an artesian well, and this undertaking has been conducted under peculiar difficulties, with remarkable perseverance. According to the report of Mr. M. C. Mecker, who visited the works recently, the workmen had drilled to a depth of 1,250 feet. The cost of sinking thus far had been about \$5,000.

Notwithstanding past discouragements, those engaged in this work are resolved to prosecute their design, under the conviction that ultimately success will crown their efforts. It is well known that the difficulties under which this branch of industry was inaugurated in France were so great that the whole power of the government seemed necessary to overcome them; but these obstacles having by that means been overcome, and all the necessary conditions having been well fixed and known, beet sugar is now produced both in France and Germany in enormous quantities, at a cost defying competition from any quarter. Should any parties contemplate a similar experiment in this country, they will do well to study carefully the history of the undertaking at Chatsworth.

Flax is very generally raised in Minnesota this year. The common reapers are used in harvesting it.

The farmers in Kansas are boasting of their enormous potato crop the present year, and a local paper rejoices with them because they are "excellent food for horses and cattle, and splendid for railroad labourers."

There is an extraordinary dearth of peaches this year in France. The market gardeners of Montreuil, the great source of their Paris supply, estimate the deficiency of their products, as compared with an average crop, at £80,000.

The *Nebraska Agriculturist* says that hedges of different sorts are growing luxuriantly in that State, and adds:—"The osage, of course, is here in all its glory. But in beauty it is far surpassed by the English hawthorn, which has proved a hardy and vigorous grower. It is the only one we have ever seen in Nebraska, and it is a model of fence prosperity and beauty."

Every time the farmer in his walks afield pulls up a weed, he destroys what will be thousands if neglected.

Vegetable raising pays well in the vicinity of Portland, Maine. Mr. J. B. Sawyer, who lives at Cape Elizabeth, two miles from Portland, has sold this season \$6,000 worth of vegetables from his place containing fifteen acres. He made a beginning eleven years ago, in debt for his land.

CANADA THISTLES.—Would it not be well for our local Parliament to pass a short Act imposing a penalty on every landowner who allows a Canada thistle to go to seed on his premises? To be of any use, the penalty must be high, and recoverable against the land, failing other goods, before a magistrate, on complaint and proof by the pathmaster or any person owning land in the vicinity. The fine might go to the township, or to form a fund for improving the roads. Such a law has been passed in Illinois, imposing the high penalty of \$75 on every person who shall allow Canada thistles to mature and produce seed on his premises; and unless something is done here to stop the spread of this noxious and troublesome weed, many sections of country will become overrun with it beyond redemption.

NEW APPARATUS FOR UNLOADING HAY, &c.—We had recently an opportunity of witnessing the operation of a new contrivance for unloading hay, straw, or grain. The invention is Miller's Patent Hay-sling, and as its name implies, is worked on a different principle from the common horse-forks or elevators. It is, in fact, appropriately designated a sling, being made of ordinary ropes stretched by cross bars of wood, the cords converging at each end to an iron eye or loop, through which the pulley rope passes by which the load is raised. This sling is in two parts, the centre bars being connected by a very simple contrivance, and when it is desired to deposit the portion hoisted, a slight jerk on a small cord disconnects the centre bars, and the load drops between them. Three of these slings are intended to be used with each load, the first being placed on the bottom of the rack, and the hay pitched on to it, till about a third of the load is gathered; a second sling is then laid on this portion, and another third of the load in like manner laid on it, and so on with the remaining third, which is deposited on the last sling. In unloading, each of these portions is lifted, and dropped in succession in the mow. When returning to the field, the slings can be hung on to the rack. The contrivance is quite simple, not liable to get out of order, and apparently easily managed. It is applicable to any kind of straw, to loose barley, or grain in sheaves. In this last particular, the inventors claim, it has the advantage over horse-pitchforks. There is no doubt that, if the makers will offer this labour-saving appliance at a sufficiently low price, it will secure a share at least of the favour and patronage of farmers.

Rural Architecture.

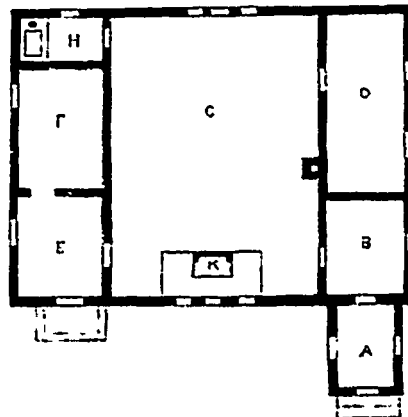


District School-houses

It is a great mistake to suppose that ugliness is necessarily cheap and beauty costly; yet too many public buildings, in rural districts especially, are constructed on this principle, and any approach to an elegant or pleasing style of architecture is scouted on the score of economy. It is highly desirable that school-houses, in particular, should be divested of all that is repulsive, and made as attractive in appearance as possible. This need not entail much, if any, additional expense. The elements of beauty in architecture are simple and easy of application. Just proportion, symmetry relieved by variety, the effect of projections in creating shadows, and a few slight details of ornament, will often produce at trifling cost the most agreeable results; and by attention to these matters a beautiful structure may be presented, in place of a square, ugly, and repulsive-looking prison-house sort of structure, such as we too often see disfiguring the roadside in country places, repelling by its very front, and proclaiming that, whatever else may be taught within, good taste and refinement are altogether ignored.

It has been our object, by giving designs

of a different class of architecture in dwelling houses and other buildings, to aid in promoting a better taste; and it is gratifying to know that many of these designs in the CANADA FARMER have been used as models in the erection of country-houses all over the Province. In the accompanying illustrations we give a plan



and perspective elevation of a very simple and cheap, yet attractive school-house, suitable for a country district. The original design appeared some time back in one of our American exchanges (we think the *Western Rural*), and seemed to us well worthy of being reproduced and

presented to our Canadian readers as a model of simple yet picturesque architectural beauty. No small share of the attractive appearance is due to the surroundings, which should always be carefully regarded. Trees we can always have in this country, and by retaining a few of these natural ornaments about a place, and planting others, as well as shrubs and flowers, the beauty of a garden and a home-like aspect are added to the pleasing effect of the building. We know school-houses thus adorned; and it is surprising how readily children will learn to do their part in keeping such a place in order, not only by abstaining from trampling on flower beds or injuring trees, but by taking an active share of garden work in their intervals of recreation.

The drawing is sufficiently clear to need very little in the way of explanation. The internal arrangements might be modified to suit the requirements of the case. In the accompanying plan, A is the porch to girls' entrance; B, girls' entrance; D, girls' cloak room or class room; E, boys' entrance; F, cap room; H, washing room; C, school-room, with the master's desk at K.

Stock Department.

Notes on Canadian Herds

NO. 6.

THE THISTLE HA' SHORTHORNS.

Situated on Lot 17, 7th concession of Pickering, near Brougham, and nine miles north of Duffin's Creek station, G. T. R., is "Thistle Ha'," the residence of Mr. John Miller, now becoming known as a considerable breeder of first class stock. He farms 450 acres of a somewhat strong clayey soil, situated on a high eminence that overlooks many miles of diversified hill and valley. He keeps about forty-five head of short-horn cattle, and sixty pure-bred Cotswold sheep, mostly bred from recently imported animals. His herd is of somewhat recent formation, and a good many of his animals are Kentucky bred, while some are descended from stock originally imported or bred by his uncle, George Miller, of Markham. This year he has imported some very superior stock from Britain.

For two or three years he used as a sire bull Prince of Bourbon [568], a bull bred in Kentucky; but finding he got too many white calves, he sold him in 1867, and brought another from Kentucky, Oxford Mazurka, now three years old, a rich red roan bred by R. A. Alexander, and got by Royal Oxford (18774), from Mazurka 11th, by Duke of Airdrie. He is a bull of neat shape and good size, deeply bred in Bates blood, and took the red card at London in the two year old class. This summer he brought out from England a bull, Fawaley Chief, now 16 months old, roan, bred by Mr. Torr, of Aylesby Manor. He is by Mountain Chief (20383) from Fawaley Garland 6th, by Booth Royal, and has four crosses of Booth blood on a Keightley foundation. He is a very handsome animal, though not yet filled out, and promises to make a large showy bull, of good form and substance, though rather light in colour. Along with him came out a roan heifer, Ruberta, from the herd of Messrs. Garne & Son, Gloucestershire, a very fine animal, solid, handsome, and well filled at all points. She carried all before her at London, and promises to become a fine large cow. She is by Masterpiece (24561) from Rose of Clitheroe. Zenobia 7th, five years, red, with some white, is a large deep-bodied cow of good substance, bred in Kentucky. She is by Derby, 4689, from Zenobia. Daisy, eight years, roan, by Prince of Wales [578], from Bes-

sie Bell, is a very large, solid, handsome cow, of high quality and fine appearance. Lorena, four years, red, by Havelock, 2588, from Cora, is a handsome, solid young cow that Mr. Miller bought in Illinois for \$450. She has a red heifer calf, Miss Hamilton, to Oxford Mazurka. Nelly Bly 2nd, three years, red, by Burnside, 4618, from Nelly Bly, is a cow closely resembling Lorena, though seemingly not so heavy. She has a roan heifer calf, Nelly Bly 5th, to Oxford Mazurka. Isabella, three years, red, by Dipihong (21547), from Mina, a cow bred by Mr. Campbell, of Kinneair, Scotland, shows a neat form and good substance. Beauty, seven years, red roan, by President [535], from Snowdrop, is a large, deep-bodied cow, but we fancy she is not pure-bred. The oldest cow in the herd is Flora, twelve years, roan, by Nichol [497], from imported Louisa. A large red roan cow, of good substance, is Fair Helen, six years, by Canadian Punch [103] from Nonpareil. Miss Marshall, eleven years, rich roan, is a splendid large cow bred by B. F. Van Meter, of Kentucky. She is by Washington [785], from Ellen Marshall. Miss Marshall 3rd, red, is a neat three year old heifer, by Prince of Bourbon, from Miss Marshall. Mary 2nd, four years, white, by Clifton Duke from Mary, is a small but shapely young cow. Flattery 2nd, red and white, a two year old, bred by W. R. Duncan, of Illinois, and got by his noted bull Minister from Flattery, is a small slim-looking thing, and not at all like what we would expect from such a noted breeder. Maggie 2nd, rich roan, is a very fine two year old heifer, by Prince of Bourbon from Maggie. She seems the best of the young ones bred on the farm. Lady Bourbon, red, is another fine two year old heifer, very large, long bodied, and well filled out. She is by Prince of Bourbon from Beauty. Flora 2nd, twenty months, white, by Prince of Bourbon from Flora, is small but neat. Daisy 2nd, twenty months, white, by Prince of Bourbon from Daisy, is compact and neat. Maggie, eight years, white, by Young England [822], from Sybil, is a large framed cow of grand size and proportions. Lastly is Gola, five years, red, a cow bred by Mr. Torr, of Aylesby Manor, Lincolnshire. She is by Booth Royal (15073), from Guardian Princess, and goes on her dam's side through the whole G family of Mr. Torr's, back to Golden Beam, with six direct crosses of Booth blood, from Booth Royal to Baron Warlabby, besides several minor crosses of the same blood, thus making her the purest Booth cow that has yet come to Canada. She is

rather a small cow, but of the most perfect form and well developed points of the breed we have yet seen. She is not a grand looking cow, but simply beautiful in every way one can view her. Her eyes are particularly large, bright, and intelligent, and she seems to be the *beau ideal* of high-bred gentleness. She has a red roan bull calf, a few days old, to Oxford Mazurka, that, judging from his appearance, seems to have nothing to recommend him, as the extreme cross in this case between two widely different strains of blood looks as if it will prove anything but successful, though perhaps it is yet too soon to judge.

There were several other animals that were at a distant part of the farm at the time of our visit, and so did not come under review. Several fine grade cows and heifers, with from three to six crosses of pure blood, were to be seen, some of them scarcely to be told from pure-bred ones, and seeming very superior animals.

Economy in Feeding Horses.

Every one who needs a horse, either for profit or pleasure, in addition to keeping him well, should study how to keep him with an outlay of the least money. The farmer who has plenty of food for his horse should be no exception. All that the farmers grow or should grow can be converted into money; there should be no waste because of plenty. If your present stock will not consume all your stock food economically fed, buy more stock to make a profit on the balance. A farmer who understands his business will always know how to do this; but never waste, although your farm and granaries may be full to overflowing.

Grass, either green or cured, is the natural food of the horse, and is essential to his good health. Green is the natural state, therefore the best; but we cannot have it green all the year round in this climate, therefore we should do the next best thing with it—steam it. Experience has proved that hay when steamed has all its natural juices and virtues revived, and is equal to grass, and nearly or quite as palatable to stock—that even mouldy hay, when steamed, is just as palatable to stock as that which has been well cured and preserved. For both convenience and economy, hay should be cut before being steamed. Hay and straw cutters have been so improved of late years and competition has so reduced prices, that there is no excuse for any man who keeps a horse not to have one.

Straw has become too valuable to be used for bedding stock. Look at its price in the market reports—it is almost equal to the best of hay, then why waste it when you can make so much more out of it by steaming and feeding it. It is not thus lost to the manure heap—it may be in bulk, but not in its

fertilizing virtues. Stable floors will have to be so constructed as to do without bedding. Farming is being reduced to a science, and those who will shut their eyes to the light of improvement and plod on in the old wasteful ways of their fathers in feeding stock, will not be able to compete with their more enlightened neighbours who keep up with the times.

There is great wastefulness in feeding whole grain to horses, or any other stock. It should not only be ground but steamed.

It should be mixed with cut hay or straw, and steamed together. This is not theory alone, it is based on experience carefully tested, and found that there is a gain of at least fifty per cent.

Now, if two tons of hay or straw, cut and steamed, are equal to three tons not thus treated, and two bushels of corn, ground and steamed, are equal to three bushels unground and raw, then every third ton and every third bushel is saved by this process which will enable the farmer to keep an extra ton of stock. Here is where the extra profit comes in.—*Stock Journal.*

Steaming Food for Stock.

On many farms it is a common practice to have what is called an agricultural boiler for cooking food, especially roots, for stock. This is usually a cheap and simple contrivance, costing perhaps \$15 to \$30, and answers every purpose where there are but few animals to be fed.

But cut straw, hay, corn-stalks, and such like, cannot well be boiled in one of these small affairs, and besides, steaming is altogether preferable, as the food is then cooked quickly at a higher temperature, and without becoming soaked with water, of which perhaps it already contains enough when in the raw state. Some farmers, we notice, have been trying to accomplish the feat of cooking by steam by the seemingly simple process of putting a box, full of holes, over the boiler, and filling it with the food to be cooked, and found to their disgust that the thing would not work. Of course not, in that way; for instead of steaming, they were but using the vapour that ascended from the open boiler, which would be of a lower temperature than that of the water from which it was given off.

Steam is only to be generated from water by confining it in a vessel that will bear a high degree of pressure, and as the water expands as it grows hotter, the surplus heat over 212° escapes in the form of steam.

In feeding a large number of stock it is altogether better to steam than boil their food, but the process can only be accomplished either by an apparatus espe-

cially designed for the purpose, like Prindle's agricultural steamer, or by using a boiler with flues, such as are made for driving machinery by steam. Buy a cheap, second-hand six, eight, or ten horse-power steam boiler, such as can often be had at the oil wells, in good condition and safe to use. Build a boiler house separate from the barn or stock shed, and so situated and arranged as to avoid giving too much risk from fire. Build a wooden box, of a size to contain enough for one day's food or more, in the basement of the barn or anywhere handy, where it is secure from frost, if possible. It should have a double bottom—the lower one and aides perfectly tight, the upper one pierced with holes. A steam pipe of any length desired may be run from the steam boiler to the centre of the bottom of the box. Cut the straw or hay (wetting it well) and the roots, mix them together, and fill up the box full to the top throughout, and cover it, but not tightly. Let on the steam from the boiler through the pipe; the space between the two bottoms of the box will be filled with hot steam, which will find its way through the holes in the false bottom and permeate the whole mass, cooking it rapidly and thoroughly.

If desired, a small steam engine may be attached to the boiler, and used to drive the machines employed to cut the fodder and roots, and, if required, to work a machine for crushing up the grain fed. When grain or meal is to be used in addition to the hay, &c., it is to be scattered over the top of the contents of the box when full, and ready to receive the steam. Such an apparatus as above described would be sufficient to cook the food for eighty to one hundred head of cattle, and require to be used but two or three times a week, if the box is made large enough.

English Stock Sales.

The Short horn herd of Mr. J. K. Fowler, Aylesbury, was sold by Mr. Stratford, Oct. 19th, when thirty cows and heifers, and nine young bulls were offered, and all sold but two of the cows. The prices obtained were generally good—the average on cows and heifers having been nearly £51, and on bull calves over £30. With two exceptions the highest prices were from sixty to eighty guineas, the only ones which exceeded those figures having been Fantail 2nd, which brought 120 gs., and Knightly Grand Duchess, which went to Mr. Leney for 210 gs. Two young bulls, the property of Lord Braybrook, were sold at the same time—Geneva's Duke, bringing 110 gs., and Cherry Duke, bringing 70 gs.

At a sale of young Short-horns belonging to R. Welsted, near Cork, Ireland, seventeen bull calves were sold, averaging over 24 gs., and three heifers at about the same average.

At the conclusion of the show of the Herefordshire Agricultural Society in October, a sale of Hereford cattle was held, embracing upwards of a hundred lots, from a number of different breeders of good reputation, and including some of the prize animals. The largest offering from a single herd was thirty cows and heifers, and eight bull calves—the former averaging a little over 26 gs., and the latter about 24 gs. On this list, but one animal exceeded 40 gs. Animals from other herds went at about the same rates, with the exception of three bulls that had taken prizes on this or other occasions, which went respectively for 85, 190, and 96 gs.

Sale of Stock.

On October 27th, we attended a sale of Short horn cattle and Cotswold sheep, at 'Thistle Ha', the residence of Mr. John Miller, Pickering. The stock was in fine condition, and the prices realized were the highest obtained at any sale this season. Nine young bulls, ten cows and heifers, and fifty-eight sheep were offered. The following animals were sold:—

BULLS.

Canadian Prince, imported, Geo. Miller, \$310
Scottish Chief, John Bellwood, \$200
Young St. Laurent, S. Haycock, \$96.
Kinnear, B. F. Campbell, \$175.
Orion, bought in, \$100.
Hector, S. Pugh, \$67.
Prince Arthur, J. S. Thomson, \$90.
Burnside, R. Callicut, \$104.
Prince of Orange, J. Dryden, \$90.

COWS AND HEIFERS.

Snowdrop, imported, J. S. Thomson, \$200.
Miller's Maid, Mr. Birrel, \$155.
Lily Dale, Mr. Birrel, \$90.
Beauty, Robert Miller, \$180.
Vesta 2nd, S. Haycock, \$214.
Lily Dale 2nd, Geo. Mitchell, \$110
Susanna, B. F. Campbell, \$140.
Mary 3rd, Robert Miller, \$151.
Red Rose, Mr. Major, \$131.
Priscilla, no bid.

The sheep sold at from \$135 to \$21 per pair for ewes, averaging \$48 per pair, and six buck lambs for \$191, averaging \$31 75 each. The attendance was good and the bidding spirited, the whole being sold in about four hours.

Correction.—Our attention has been directed to an error which inadvertently crept into the account, of Mr. Stone's Cotswolds. The shearing ram exhibited by him at Kingston in 1867, gained the second prize; the first having been awarded to Mr. Cochrane for an imported ram, afterwards purchased by Mr. Snell. Mr. Stone's shearing, however, gained the Prince of Wales' Prize in the best pen of one ram and five ewes exhibited at the same fair.

Large Purchase of Thorough-bred Stock.

The splendid herds of Short-horn cattle of John White, Esq., M.P., and of his late partner, Mr. Joseph Kirby, have passed by purchase into the hands of the Hon. George Brown, and have been removed to Bow Park. These well-known herds mainly trace their origin from the excellent old stock of the late Rowland Wingfield, and the late Hon. Adam Fergusson, of Woodhill, improved by such bulls as Ethelbert, Butterfly, Duke of Marlborough and Breadalbane. The purchase embraces, among other fine animals, the following well-known cows: Florence, Mercy, Iris, Flora, Mary, Phoebe, Miss Miller, Mountain Daisy, Young Countess, Magnat, Diadem, Dairymaid, Duchess 2nd, Blink Bonny, Buttercup, Duchess 3rd, White Rose, and Maid of Ontario. It also includes a number of beautiful heifers, such as Louisa, Blink Bonny 2nd, Butterfly Bloom, Victoria, Virtue, Duchess 4th, Myrtle, Memory, Dolly, Jenny, Agnes, Mathia and Charlotte. The two year old bull Candidate, the yearling bull Young Duke of Marlborough, and three fine bull calves, go with the herd.

Mr. Brown has also acquired Messrs. White & Kirby's famous flock of long-woolled sheep, including some of the finest Leicester and Cotswold ewes and ewe-lambs in Canada.

Items of Agricultural Experience.

21. Stock well summered are half wintered. If they go into the stable in good condition, have warm quarters and wholesome food, they will keep growing, and come out in good condition in spring, with less consumption of food than if stunted half the time.

22. Regular feeding and watering, good shelter and bedding, should be points aimed at by every stock breeder.

23. Large boxes for feeding are preferable to racks, and allow of less waste of food.

24. Hay that is cut and steamed, or even moistened, will go further than hay fed cut uncut.

25. Cut straw steamed or pulped with boiled roots will be relished by stock better than the best dry hay.

26. All kinds of grain will go fully one-third further fed to stock ground or crushed than whole.

27. All animals thrive better for getting some roots, be it ever so little; roots seem to give tone to the digestive organs.

28. Horses, whether worked or not, should be kept well groomed and blanketed.

29. Milch cows are better to be dried off than kept on giving but a small yield of milk.

30. Good ventilation of stables is a great preventive of disease, but the ventilation should be so arranged that there will be no cold draught over the animals' bodies.

Veterinary Department.

Congestion of the Lungs in Horses

With the sudden change of weather, we have had an opportunity of noticing a great increase in those diseases attacking the respiratory organs of the horse, and usually at this season congestion of the lungs is a very frequent complaint. The chief causes are sudden changes in the state of the temperature, fast driving and then exposure to sudden chills, or working horses when suffering from catarrh. It is also produced by bringing horses up from pasture and placing them in a close stable, the air of which is vitiated. This has a very injurious effect on the horse generally, and particularly on the respiratory organs. Congestion of the lungs is consequently often met with in young horses, from the cause just mentioned. It may also proceed from fast riding or driving, when the horse is in an unfit condition to undergo rapid exercise, either from being too fleshy, or from a want of regular exercise.

The symptoms of congestion of the lungs are suddenly developed. If occurring when at work, the horse all at once flags; he becomes extremely slow in his movements; he breaks out in a copious perspiration, and heaves heavily at the flanks; the breathing is accelerated and performed with difficulty; the perspiration increases, the ears and legs become cold, and the pulse is weak. When occurring a short time after work, congestion is usually ushered in by a shivering fit. The horse shivers, the hair appears standing up, the ears and legs are also cold, and as the shivering disappears, the breathing becomes accelerated and heavy. In this common complaint, whether occurring on the road or in the stables, we recommend in the commencement of the disease the free use of stimulants, and those stimulants that also have a diuretic tendency are generally found to be the most useful. An easily procured and convenient remedy is sweet spirits of nitre, two ounces, given in six ounces of cold water. If no medicinal remedy is at hand, a good dose of warm beer has an excellent effect in equalising the circulation. The horse should also be warmly clothed, and at the same time allowed plenty of fresh air. Hot clothes applied to the chest are generally productive of good results. After an attack of congestion the horse should be carefully used, only giving moderate exercise until the lungs have completely regained a healthy condition. Congestion of the lungs, if

not relieved, frequently terminates in pneumonia, or inflammation of the lungs, which in many cases soon terminates fatally.

Injuries to the Horse's Mouth.

The horse's mouth is very often injured in the giving of medicines, from carelessness in administering them, and from the tongue being forcibly pulled out, in some cases to such an extent that the muscular substance of the tongue is completely paralysed. A few days ago we were called to a case in this city where the tongue was injured and lacerated to such an extent that it was necessary to remove the injured part. The owner of the horse caught hold of the tongue violently, the horse reared, and he continued to hold on to the tongue, rupturing the *frenum lingue*, and also the substance of the tongue, causing about three inches of the organ to hang pendulous from the mouth, and the poor animal, in endeavouring to masticate some food, caught hold of the protruding tongue between the incisor teeth, lacerating it fearfully. The only remedy was to remove the lacerated parts. We merely mention the above case to show the irreparable injury that may arise from the too common practice of holding on forcibly by the horse's tongue. In many cases, although not torn, it loses its mobility in a great degree; therefore we cannot too strongly recommend persons who find it necessary to give medicines in the form of a ball, to be careful and not pull the tongue violently. Whenever the horse shows signs of fear, or attempts to run back, then let go the hold at once.

The mouth is occasionally injured from some foreign substance becoming lodged in the palate, between the two rows of molars. The substance is often a piece of wood, which the animal takes into his mouth, and it becomes firmly wedged, giving rise to great irritation. When situated towards the posterior part of the palate it is not so readily detected. The horse is unable to masticate his food in a proper manner, and there is an increased discharge of saliva from the mouth. The remedy in such cases consists in the removal of the irritant. In all cases where the mouth shows signs of injury, exhibited by an increased flow of saliva and inability to masticate properly, it should be very carefully examined. We have had an opportunity of seeing two cases this fall, where a piece of wood had been lodged between the upper row of molars for six or seven days, causing acute inflammatory action, and, of course, great loss of flesh.

DISEASE AMONG CATTLE.—We notice in the *Rural New Yorker*, and one or two other agricultural papers, that a new disease has appeared among the cattle in Monroe County, N. Y. From the description given of it, it appears to closely resemble the foot-and-mouth disease, now becoming so alarmingly prevalent in England.

The Dairy.

How to Start a Small Cheese-Factory.

We have had many enquiries as to the proper mode of construction, and cost of materials and outfit required for a small cheese factory, capable of using the milk of from thirty to fifty cows. Cheesemaking is a profitable business when well managed, and there are many places where there is not perhaps one person with energy and capital enough to start a factory on a large scale, yet half-a-dozen neighbouring farmers, by uniting together, could make a very good thing by turning the milk of their cows into cheese. Even in the best dairy districts of New York State, it is beginning to be discovered that very large factories do not succeed the best, as the unavoidable necessity of bringing much of the milk a long distance, often by rough roads, in bad weather, causes the different messes brought in to be of very unequal quality, and much uncertainty in the process of manufacture results.

In locating the factory, the first requisite is to have a good supply of pure cold spring water, and, if possible, so situated that it can be brought into the premises by the force of its own natural flow through an inch pipe, to a height above the vats that will enable them to obtain a full supply at all times, when necessary.

Every provision must be made for cleanliness, by so locating the building that it has a slope on one side at least sufficient to enable drains to be made that will readily carry off all rain-fall, or any superabundant moisture from the soil, as well as the washings, whey, &c., from the interior of the building itself. If swine are to be kept to be fed on the whey and other refuse, they must be located far enough to the north-east of the factory to prevent any risk of bad odours being blown towards or into the building. The size of the building may vary, according to circumstances, from 30 feet by 15 to 40 feet by 20, but it should be a parallelogram, divided in such a way as to leave one end for a curing room, and the other for a making and pressing room, with the vat extending across at the extreme end of it. The walls should be at least ten feet high to the plate, and the curing room is to be divided off by a solid partition, reaching up to the roof, and entered by a close door. A door should also be made so as to admit of entrance from the outside. This is necessary, in order to prevent the vapour from the heated whey getting into

the curing room, and so retarding the drying and curing of the cheese. The curing room may be made of two stories, if desired, and the upper story be lathed and plastered, and a small stove put in to heat the room during the spring and fall, when the weather is cold and unfavourable for the curing process.

The building must have plenty of windows, at least three outer doors, and good ventilation secured in the make room by having it open to the roof, and a small ventilating tower with louvre bars put at the top. The sides are to be either battened or clap-boarded, and a tight floor that can be easily kept clean is necessary. At the end next the vat is to be a platform for receiving the milk from the outside, through a small door that is at just such a height from the ground as will enable the cans to be readily lifted in from a waggon outside.

The cost of the building will depend on the price of materials, but it need not be much, and if put up by the patrons themselves, assisted by one carpenter, it will cost still less. They can also construct the press frames, which should be strong, heavy and substantial, so as not to warp or spring.

For a small factory, vats with self-heaters are the most economical. A self-heater needs no boiler or mason work, simply a stovepipe to conduct off the smoke, and half a dozen cords of good dry maple, split fine, will run one the entire season. Tables are preferable to setters and ranges, and can be made by any carpenter. So much depends on having the cheeses of an exact size and trueness in weight, that good hoops and presses are essential. Small-sized cheeses are most in favour. The curd sink can also be made by any carpenter, but it is important that it should be constructed out of clear and well-seasoned pine, planed smooth, the bottom being one and a half inches, the sides one inch thick, the legs strong and well braced, and running up to the top edge of the sink, which should stand three feet clear of the floor. The size of the sink is often a puzzler, and must be regulated by the number of cows that supply the factory with milk, but for fifty cows it may be eight feet long, two feet wide, and nine inches deep.

Of the other apparatus needed, the maker, Mr. H. Pedlar, Oshawa, gives the cost as follows:—

Vat and heater complete, with agitator, syphon and strainer	\$30 00
Three hoops and follower	6 00
Three press screws	9 00
One curd knife, scoop, lactometer and thermometer	6 00
	\$51 00

There would be scales and weighing can required, to enable the cheesemaker to weigh the milk, in order to adjust the proportion of rennet, and also the cheeses when made and boxed.

The water pipe should be carried under ground, out of reach of frost till it reaches the factory, when it may be fixed so that the part above ground can be removed during the winter. Faucets should be put on the pipe at every point where water is desired to be tapped.

A small factory of this kind can be managed by a good dairymaid, with the assistance of a man occasionally to screw down the presses, lift out the cheeses and carry them to the curing room, should they be too large for the maid to manage.

Little Falls Cheese Market

The *Utica Herald*, after giving a sketch of Little Falls, Herkimer Co., N. Y., says that "from its situation as the central point of the most important cheese producing section in the United States, this village has come to be one of the greatest rural cheese markets in this or any other country. Thus from May to December, thronged with sellers and buyers, its market street on Monday, the market day, presents the appearance of a miniature Wall Street. The past season has been one of unusual activity in the market, and the transactions have been unusually large. The aggregate shipments of dairy have been thus far larger than ever before, while the sales of factory during the last six months alone have reached an aggregate of about one hundred thousand boxes, or allowing an average weight of 55 pounds to the box, an aggregate of 5,500,000 pounds. At sixteen cents per pound (the estimated average of prices for six months ending Sept 1st), the amount paid for factory cheese alone during the time estimated has reached a total of \$850,000. Estimating the sale of dairy at 1,500 boxes per week, the aggregate sales for the same period are 36,000 boxes, or allowing fifty pounds to the box, 1,800,000 pounds. The sum paid for this amount of dairy cheese at fifteen cents per pound, the estimated average for the specified six months, reaches \$270,000. It will be seen from these estimates, which are believed to be very nearly correct, that the entire number of boxes of factory and dairy cheese, which have changed hands at this market during the last six months, has reached an aggregate of 136,000 boxes; the whole number of pounds 7,300,000, and the entire amount paid for the same, \$1,150,000. These statements give some idea of the transactions in cheese. Transactions in butter, which are quite large in the early part of the season, if added to the amount of money paid for dairy products as estimated above, would materially swell the figures."

Hard Milker--A Cure

Some years since an intimate friend of mine had a young cow, about two years old, given him. She was all the donor had to give, and went but little way towards repaying the debt of gratitude due by him. The heifer and calf were brought to my farm to become, by careful handling, of some use as a cow. I tried to milk her, and after an hour's hard pulling I obtained about half a gallon of excellent milk; she stood perfectly quiet, and bore any amount of dragging at; but imagine the labour of continually milking such a cow. Her teats were small, and the stream of milk obtained did not exceed in size an ordinary pack-thread. Even the calf could not drain her under a full half hour's hard work. We gave up milking her as a bad job, and allowed the calf to run at her side until several months old, and as it was a heifer calf, we determined to allow the cow to rear it; which she did until winter was far advanced, when it was weaned. The next spring the cow had another calf, and we determined to milk her; in fact, there was no alternative, as the family had fallen into misfortune, and the cow was then more than ever necessary. My friend worked away morning and night, milking her himself, for no woman could possibly succeed, as it was so dreadfully hard to get from her a patent pail of milk, and she always gave as much as that, and often more if the strength and patience of the milker held out. About that time I was away from home, and on Saturday night, I was rather amused, on my return, to see my friend chasing cow round and round the enclosure, with an American lasso, which, at last, he got over her head and drew her up to a post. I paid but little attention at the time to what was going on, but the loud "woa, woa," attracted me to the spot, and there I saw a sight that would have made the gravest man smile. My friend, who was a retired dry goods merchant, was attempting to cut a notch in the cow's teat, so as to admit of the milk being drawn more freely. This most extraordinary performance was occasionally varied by his attempting to cut off her long evergrown toes, which turned up like small horns. He had a mallet and chisel, and whenever he could catch the cow's attention attracted by some other object, he would give a sharp blow with the mallet and chisel on the projecting and offending toe. The cow was so gentle that she did not resent the attempt by kicking much. When this course of surgery could no longer be borne with bovine patience, the operation was varied by another snip at the point of one of the teats. I expostulated, but in vain, and was laughingly told that the cow could not be milked as it was, and if a larger hole could be made in her teat, it must make it better for the milk to run through. If, on the other hand, irretrievable mischief was done, why, the cow could be fattened. As for the toes, my friend thought it best to

attend to all the surgical operations at once, and was, as he expressed himself, bound to "make a spoon or spoil a horn." I at once enlisted in the cause, and first hobbled the cow, and succeeded in cutting a slit in one teat about one-fourth to three-eighths of an inch in length, and, to my surprise, the end sought to be obtained was fully answered, for the cow milked from that teat perfectly well. I therefore completed the cutting of a similar depth into each of the remaining teats, and all milked freely. Whilst my hand was in, I also cut off her toes, and contracted the overgrown hoof so that the poor brute could walk easily, and without distortion of movement. Next morning we had some trouble, and a "lively time" to milk her, and each day for about four days I was obliged to tie her legs, as cow fortitude would not bear such rough usage, and be milked through such sore teats. In a short time, however, the teats healed, leaving a cut of about one-eighth of an inch, or probably nearer a quarter, that never closed: but the cow for many years milked as well as any cow could do, and one teat, that was cut deeper than the others, was perceptibly the easiest to milk; so much so that after calving this one teat would leak milk somewhat. But, on the whole, the experiment was entirely successful.

When I say that my friend had never before owned a cow, and was an ex dry goods merchant, the originality of the experiment will not be so much wondered at. He reasoned thus; "This hole in the cow's teat is too small. What can I do? Cut it larger." And he did so. I have since tried the same experiment with perfect success. But one thing must be guarded against; that is, not to cut carelessly, nor without judgment, but to open the orifice until milk comes easily, and it will never again close up. If cut too deep and through the muscle that prevents the milk all running out, the cow will be spoiled, as she will not be able to retain any milk in that quarter of the udder.

C.

Feeding Potatoes to Milch Cows.

In view of the fact that potatoes are so abundant this year that they are scarcely worth carrying to market for the price they bring, those who have cows in good milk during the cold season, will find it of great advantage to give them a few potatoes daily. They are the best root that can be given to cause cows to give an abundant flow of milk of a rich quality, and free from any disagreeable flavour. Some years ago, when potatoes were cheap, we knew of a farmer who fed them largely to his milch cows along with good clover hay, and they gave an increased quantity of butter of fine flavor, and as yellow as that made in summer time. The potatoes ought to be sound and free from rot, which is injurious, though if slightly frozen the cows will eat them without suffering any injury. The potatoes should be free from dirt when fed out.

The Devon as a Dairy Cow.

The Devon may be called medium in the quantity of milk, and in its quality superior. The older, or unimproved race, were somewhat noted for the quantities of milk they produced, as well as its good quality. A gallon of Devon milk yielded more butter than that of almost any other breed, as it does now, except the Alderney. But the improvers, in the attainment of a finer form and heavier substance in their animals, perhaps sacrificed somewhat of the quantity of milk for the more liberal development of flesh, well knowing that both flesh and milk could not thrive equally together in the same animal; although, when the milk ceased, the flesh came on with due rapidity, under generous feed. Yet, with an eye to breeding her solely for milk, she is well fitted for a dairy cow. Docile in temper, easy in keep, placable in disposition, she is readily managed. Her udder is soft, tidy in shape, with thin, silky hair upon it, clean, taper teats, easily drawn, and every way satisfactory to her keeper. We have kept thorough-bred Devons thirty-four years—sometimes as high as twenty-five or thirty (not all milch cows) in number. Many of them have been excellent milkers, and some of them extraordinary for their size. We once had two three-year old heifers, with their first calves, which gave for some three months after calving, on pasture only, with steady milking, an average of eighteen quarts per day; and from cows which we have at different times sold to go to other States, the accounts of their milk have been equally good. It is but fair to say, however, that after we commenced crossing our cows with bulls of later importations, some fifteen years after the commencement of the herd, the large milkers were not so numerous, although the cattle from these crosses were somewhat finer. The bulls we used were apparently bred from stocks highly improved, with an effort more to develop their feeding properties than for the dairy. After all, our Devons yielded, on an average, quite as much as any common cows we ever kept, with much less consumption of forage. With all her alleged deficiencies, the Devon possesses the inherent qualities of a good milker. Her dairy faculties may be bred out of her by neglect of that important item, and with a view to give her an earlier maturity, and more weight of flesh; but even under that system she will occasionally persist, as we have known in various instances, in giving a large flow of milk, exceeding many common cows of equal size. On the whole, from the accumulated accounts we have received from time to time, coupled with our own experience, we pronounce the Devons, as a race, when bred with an eye to the development of the dairy quality, considering their size and consumption of food, good dairy cows, both in the quantity of milk they give, and the butter it yields.—*L. F. Allen's American Cattle.*

Carrots for Milch Cows.

Mr. Willard, in the *Western Rural*, expresses a very high estimate of the utility of carrots as winter food for milch cows as well as horses, an estimate in which we fully coincide, and which has repeatedly been stated in this journal. Mr. Willard says:

Of the various kinds of roots which we have employed for feeding milch cows, we like none better than the carrot. The expense of growing carrots on our Eastern soils is more than for other roots, but it is a very excellent food either for horses or cows, and can be at any time fed to the latter without producing any disagreeable taint to the milk.

The average analyses show that carrots contain nearly one and a half per cent. of nitrogenous principles, and nearly twelve per cent. of heat-producing elements. According to Hermbstat, the constituents of the carrot are as follows:

Water	8.00
Starch and fibre.....	.90
Gum (pectin)	1.75
Sugar	7.08
Albumen	1.01
Oil	0.35

These roots offer one of the best kinds of winter fodder for cattle, while their tops are also greedily eaten, and can be used to a good advantage late in the fall. A cow supplied daily with hay and an allowance of carrots will be kept in good condition, and produce a quantity of milk at least equal to that yielded from any other root. The butter will be of good quality, and free from the disagreeable taste frequently given it by turnips.

The carrot is not nearly so exhaustive a crop as the potato. The long root of the carrot penetrates the subsoil, and besides exerting a mechanical influence, draws its food from a deeper source, thus leaving the surface soil to accumulate the fertilizing ingredients necessary for other crops. As a feeding material, one of the valuable constituents of the carrot is found in its pectic acid, which has the power of gelatinizing the fluids in the stomach, thus rendering the contents more available and more easily digestible.

It is said by those who have experimented in feeding horses with carrots in connection with oats, that three bushels of carrots are equal to two bushels of oats in nutritive effect. That is, that three bushels of carrots and two bushels of oats, when fed in connection, are equal in nutritive effect to four bushels of oats, while the operation of the carrots is to produce a brighter eye, a glossier coat, and more healthful appearance than when hay and oats alone are fed. Possibly this is too high an estimate, but however it may be, there can be no doubt that the carrot, in connection with other food, is a very superior winter and spring fodder, both for milk cows and horses. It should be more extensively used than it is.

American Dairymen's Association.

The American Dairymen's Association offer a prize of \$100 for the best essay on "The claims of cheese as a wholesome, nutritious and economical article of food." No special conditions will be imposed respecting the length of the article. It is designed to make use of the substance of the essay by publication in the next annual report of the Association, by spreading it abroad through the press, and in other ways, so as to lead to the large consumption of cheese as an article of food. Papers on the subject should be sent to the Secretary of the Association, Gardner B. Weeks, Syracuse, N.Y., as early as Dec. 20. The awards will be announced, and the money paid, at the annual Convention, to be held in Utica, Jan. 12th and 13th, 1870.

The following are the topics of discussion that will come before the meeting:

Natural heat and odour of milk.

Rennet, its nature and varied effects.

The proper treatment of acidity in cheese-making.

Floating curds, their causes—best treatment.

Shall cheese-making continue to receive the entire attention of this Association, or shall its scope and field of operations and investigations be so extended as to include the subject of butter-making?

Milking with Dry Hands.

A correspondent in one of our exchanges makes the following remarks which are quite in accordance with suggestions given by us in an article entitled "Spring Work on the Dairy."

"I believe that much of the milk gets tainted with noxious or bad odours before it reaches the pail. Some persons, and hired help especially, have a habit of wetting their fingers with the milk once in a while, and then wetting the cow's teats, as they say, to make them milk easier. Now this wetting process causes much foul stuff to drop from their hands, or the teats, into the pail while milking. This is all wrong—cows can be milked as easily with dry hands as wet ones. I have been in the habit of milking cows; and although I have met with some hard milkers, that require their teats to be softened in order to draw the milk, I have generally found it both easier and pleasanter to milk with dry hands. If the teats are dirty, the udder should be washed with tepid water, and allowed to dry before milking; and if the teats are very hard and tough to draw, the cow had better be turned into beef, or kept to raise calves from."

Since the outbreak of the foot and mouth disease among milch cows in England, and the danger incurred in the drinking of milk drawn from diseased animals, there has been a great demand for milking goats as a substitute for cows' milk, and from 2½ to 4½ and 5 guineas are paid for young, healthy milch goats.

The Cow's Tail.

I have noticed in the *Western Rural*, the past few months, several ways to secure cows' tails while milking, none of which, to my notion, meet the case. My plan is this: First, to have the right kind of a milking stool. The stool should be twenty inches long, and ten inches wide, with four legs—two at each end, twelve or fourteen inches long. One end of the stool should be rounded. With this kind of a stool, the milker seats himself on the square end, and puts the bucket on the rounded end, between his knees. If the cow whisks her tail, put the end of the tail between the left knee and the bucket and hold it there until the cow is milked. This plan works to a charm with me, besides one always has a clean bucket and no "spilt milk."

I milk eighteen cows this season. In June the cows averaged one pound a day for each cow, on grass alone, only feeding during the day, being corralled at night. Have made 2,216 pounds of butter up to this date (Sept. 27).—*Cor. Western Rural.*

BAD ODOURS IN THE DAIRY.—Instances of the injurious effects of bad odours on the products of the dairy, are of sufficiently frequent occurrence to show the importance, indeed, the absolute necessity, of avoiding all such causes of impurity. Mr. Willard, in a recent issue of the *Western Rural*, relates the case of a dairy, in which thoroughly well made and otherwise excellent butter was seriously damaged in flavour by a defective drain under the closet in which the cream-pots stood, and the emanations from which had affected the cream, and caused the deterioration in its quality. Nothing more readily imbibes subtle odours in the atmosphere than milk or cream, and the utmost care and greatest cleanliness are required to keep the air of the dairy sweet and pure.

STIMULANTS IN MILK FEVER.—The publication of the alcoholic cure of cows suffering under this terrible and hitherto fatal complaint, has brought forth a great deal of discussion in the English agricultural papers. The veterinarians feel aggrieved that the old treatment is found fault with, and the cow feeders come out strong with the actual results of their alcoholic treatment. Several London cow keepers have appeared in print, and state that their universal practice in such cases is to administer large and continuous doses of spirit, and with good success. Indeed, some go farther, and declare that spirit is an almost certain cure for pleuropneumonia as well as milk fever. Now, the best phase of the cure seems to be that it can be tried at any time while life continues in the animal. This being the case, it will, no doubt, be extensively adopted. There is no difficulty, unfortunately, in getting any amount of whiskey in any part of the Province, and it certainly is a much better use for it to apply to sick animals, than to brutalize the animal's master or owner.

Entomology.

Notes and Experiments on Currant Worms.

The larva of *Neodulus Ventrivorus*, alas, too well known under the popular designation of "currant worm," has been very abundant in this neighbourhood during the present season. In my own garden it has been a continual fight as to who should have the currant and gooseberry bushes—the worms or their rightful owner. During the early part of summer, anticipating their attack, I was on the look out for them, and by timely doses of hellebore preserved the foliage with but little damage. In about a fortnight later, having omitted inspection for a few days, I was surprised to find the bushes being stripped again, and this time the enemy had got so far ahead as to damage their appearance considerably. Another prompt dosing of hellebore brought relief. After this I hardly ever found all the bushes entirely free from them; a walk around the garden would reveal a few here and a few there, and I was perpetually handkilling and brushing off these smaller detachments. Four times during the season I found it necessary to apply hellebore freely, for the foes were a legion.

During the middle of August, being occupied with other matters, the garden was neglected for a few days, when on visiting it again on the 19th, I found many of the bushes entirely leafless, and the foliage remaining on the others rapidly disappearing. I felt discouraged, and began to have some misgiving as to whether hellebore was after all such an unfailing panacea for this almost universal pest as we had supposed. I resolved, if possible, to satisfy myself fully on this point, and having mixed about one and a half ounces of powdered hellebore with a pail of water, was ready to proceed. I selected a leaf from two bushes, marked them and counted the number of their inhabitants. One was occupied by about forty-four worms of different sizes, crowding it above and below, and it was about half eaten: the other leaf had twelve nearly full grown on it. Having transferred the mixture of hellebore and water to a watering pot, the bushes were sprinkled with it. I returned to examine the result in three-quarters of an hour, and the leaf which at first had forty-four on it had now only two, and these were so far exhausted that they were unable to eat and could scarcely crawl, while on the other leaf out of the twelve there remained three, but in the same enfeebled condition. All around under the bushes the ground was strewn with the fallen foe, and I felt perfectly satisfied that entire reliance might be placed on this means of defence.

I did not anticipate such speedy action on the part of the hellebore, or should have re-

turned to the examination sooner, and the bushes were so entirely cleared, that excepting on one I had reserved for another experiment, I had no means of repeating the dose.

There was one thing that struck me as something remarkable, the portion of leaf on which the greater number were feeding appeared to be the same size as before the hellebore was applied—if smaller I could not perceive it. When the leaves dry, which have been sprinkled with the liquid, a very thin coating of the powder, more or less regular, is found over them, and I had always supposed that death resulted from eating a portion of the leaf thus coated. Such is undoubtedly the case when the hellebore is applied dry, but in this case a meal, however small, made by forty-four caterpillars on half a leaf, must have materially diminished it. I am disposed to believe, then, that the death of most of these must have resulted from their imbibing or absorbing some of the liquid as soon as it was applied. Many of them showed symptoms of the violent cathartic action of the remedy, having a mass of soft exuvia hanging to the extremity of their dead bodies.

I had reserved one bush, on which were a good number, for another experiment. It sometimes happens, especially with those who live in the country, that hellebore is not at hand when the worms are first observed at work, and a few days' delay in procuring it is perhaps unavoidable. In such cases the bushes may be entirely leafless before the remedy can be applied. Hot water suggested itself to my mind as likely to be of some service, and being also readily procurable in every home. It is well known that many plants will bear such an application without injury, provided the heat is not too great. Taking some in a watering pot, a little hotter than one could bear the hand in, I showered it plentifully on the affected bush, and it was amusing to see how the caterpillars wriggled and twisted, and quickly letting go their hold, fell to the ground, which was soon strewn with them. After the first excitement produced by the sudden heat was over, they remain'd as if wishing to "cool off" before commencing work again. A few did not recover from the application, but most of them were soon as active as ever.

Now what I would suggest is this, that where hellebore cannot be at once procured, no time should be lost in applying the hot water, and when once on the ground the creature may have the life trodden out of them by the foot, or beaten out with the spade or some other implement. In any case many of them would never reach the bush again, for enemies beset them on every side. I was amused to see how busy a colony of ants were who had a home at the base of a tree near by, lugging these large caterpillars along, a single one of which would take three or four to manage. The worms were twisting and jumping about, as if they were

dered whose hands they had got into, and the ants were hanging on with their sharp jaws and slowly dragging the bodies along. By and by they had quite a little pile accumulated, which would no doubt furnish them or their progeny with a feast of fat things for some time to come. Then there are the tiger beetles (*Cicindelidæ*), with a host of others ever running about, looking for stray objects of this sort on which to make a dainty meal.

I had observed on one of the bushes, before applying the hellebore, some friends at work on these worms. They were immature specimens of a true bug belonging to the order *Hemiptera*, and probably the young of *Stiretus fimbriatus*. These creatures are nearly round, about the size of a common lady bird, having the head, thorax, and legs black, and the abdomen red, with an elongated black spot in the centre, divided across by a whitish line. Approaching a caterpillar, they thrust their proboscis into it and quietly suck its juices until it becomes so weak and exhausted that it shrivels up and dies. With the view of testing the probable amount of good these friends were thus capable of accomplishing, I shut up two of them in a small box, with a dozen nearly full-grown caterpillars, and at the end of three days found that they had consumed them all; also six in another box with one bug, and in this instance the rate of consumption was about the same, two caterpillars a day for each of these little creatures. The second time I fed them they did not get through their work so quickly; possibly they may have overfed themselves at first.—W. Saunders, in the *Canadian Entomologist*.

Cabbage Insects.

Most people in this country, probably, are fond of a dish of cabbage as an adjunct to their corned-beef or boiled pork in the winter time, when other vegetables are scarce; though this is a weakness that we do not ourselves coincide in, the odour of boiling cabbage not being appreciated by our too delicate olfactories, we yet can quite agree with an old friend who used to say that "a little bit of Early York cabbage, with a nice piece of bacon or a tender spring chicken, was not half bad!" Tastes, however, will differ, and the bounties of Providence are quite varied enough to suit the most fanciful and the most fastidious: so that if one dotes on cabbage, and another detest it, it need make nobody unhappy—there is plenty of good food for both. But man, it seems, is not to have all the cabbage to himself; there are several insects who like to take a share as well, whom we now purpose to bring before our readers.

The largest of these that we are acquainted with is a remarkably handsome caterpillar, that feeds openly in the day-time on the outer leaves of the cabbage; but though thus exposed, it protects itself from injury by coiling itself up in the form of a snail-shell, and dropping to the ground, when disturbed. Its colors are deep black, light yellow, and white; along the back there is a deep velvety black stripe, extending from head to tail; this is followed on each side by a beautiful bright yellow stripe, then another black

stripe broken up into little angular marks by a great number of pure white lines running over it in all directions, and forming characters, compared by Dr. Harris to Runic letters; the head, feet, and under side are yellowish red. This caterpillar is usually seen in September and October: in the latter month it goes into the ground and forms its chrysalis, and in June it comes out as a handsome moth, called the *Mamestra picta*, Harris, "the painted Mamestra." in allusion both to the beautiful tints of the caterpillar, and to the softly blended shades of dark and light brown with which the fore wings of the moth are colored," (Harris). We have taken a few specimens of the moth in the neighbourhood of Toronto, and have also observed the caterpillar. One specimen we have, now sleeping through the winter in a chrysalis state. It is not very common, but if it should become destructive, the caterpillars are easily seen, and can be destroyed without difficulty.

Worse enemies in the caterpillar form are the various species of Cut-worms (*Agrotis*), that cut off the young plants in the night and keep in concealment during the day. These, as every gardener, probably, knows from experience, are fat, greasy, dull-colored caterpillars that turn into dull-brown or grey common looking moths. As it is not very long since we gave some account of these pests we need not enter into particulars again now, but may pass on to another enemy belonging to the same order of insects.

In 1863, Mr. Bowles, of Quebec, found a new butterfly very abundant in the neighbourhood of that city, and in the following year published a paper in the *Canadian Naturalist and Geologist* (Aug. 1864, p. 258), giving a full account of its habits, capture, &c. It proved to be the Common White Cabbage Butterfly of Europe (*Pieris rapæ*, Linn.) whose larvæ are so destructive to this vegetable. It had evidently been introduced into this country some six or seven years before, by means of refuse thrown from some ship or ocean steamer. Now it has spread over the greater part of the Province of Quebec—this year it has been very destructive about Montreal—and into the neighbouring States of Vermont, New Hampshire, Massachusetts, and even as far south as New Jersey, close to the city of New York. No doubt before long we shall be mourning over its ravages here, as it is exceedingly prolific, very hardy, and rather a general feeder; when it cannot get cabbage it eats various other vegetables, and then goes to the flower beds for Mignonette, Nasturiums, etc., and will even thrive on willow leaves. There is no hope of starving it out, so other means will have to be adopted. We purpose shortly giving a further description of this troublesome insect, with figures of its different stages.

Another European caterpillar attacking the cabbage has been found in Illinois and other States, and may be expected to find its way into this country. It is called *Plutella crueiferarum*; it is a small green worm

about one-third of an inch long, which eats the leaves of the cabbage, frequently riddling them like a sieve.

A fifth pest which we have often observed on cabbages is the Mealy-louse (*Aphis brassicæ*), myriads of which, closely huddled together, may frequently be seen on the under side of a leaf. It does not vary particularly in its habits, so far as we know, from other insects of the same genus, but lives upon the juices of the plant it inhabits, drawing them out with its suckers, and gradually impoverishing the leaf. It is remarkable for the curious leaden-coloured mealy substance with which it is covered. It may be destroyed with hot water.

A species of centipede (*Polydesmus comphutus*) has been observed by Dr. Fitch to destroy the roots of young cabbages and other plants in the State of New York; and in Texas, a bug (*Strachiu histrionica*, Hahn.) completely eats up the cabbage plants, radishes, etc.; neither of these insects, however, is known in Canada.

Insects Affecting the Balsam and Spruce.

To the Editor.

SIR,—I recently observed in your columns a communication from a correspondent, enquiring whether the Balsam or the Norway Spruce is the best to plant for shelter.

I would observe that, in this part of the country, the balsam has been almost destroyed by a small green caterpillar with a dark head, about the size of the gooseberry caterpillar. This happens more about the town neighbourhood and roadsides. I have seen them, during the early part of summer, on parts of the tree as thick as the spines, while other parts of the tree looked red and rusty as if scorched by fire, leaving it in the autumn with very little foliage.

Last summer I cut down about fifty balsams round my garden, owing to this, and a neighbour that has trees planted from twelve to fifteen years is going to serve his in the same way. After the insects have completed their caterpillar state, they form themselves into small pupæ on the trees, from which I have opened them before they had got into their dormant state.

This summer I found a few of the Norway spruce, and also on the common spruce, but they had not touched them before the balsams were cut down, although growing together.

Not having any of the balsam caterpillars to compare with them, I am not quite certain if they are the same kind. It is only a few years since these pests have shown themselves here. As yet, I have not seen the cedar touched, which is here quite plentiful.

It is vexing to have trees look fair and beautiful till they are well grown, and then have to cut them down. The cherry and pear tree slug, of which we have had only the first brood this summer, is easily dealt

with, but these caterpillars, I am afraid, are more than we can manage, unless you can put us up to a remedy.

Owen Sound.

J. McL.

NOTE BY ED.—The insects alluded to in the foregoing communication are, no doubt, the larvæ of some species of saw-fly of the genus *Lophyrus*, several of which attack in the manner above described different kinds of pine and fir trees. Our correspondent certainly punished the wrong party when he cut down his balsam trees, unless, of course, they were too much injured to be any longer serviceable. It would have been better to have made a vigorous onslaught upon the caterpillars first, and if that had altogether failed, then it would have been time enough to put the axe to the trees. These worms can be destroyed by syringing them with a solution of carbolic acid, whale-oil soap, tobacco water, or white hellebore, or if none of these articles are at hand, they can be dislodged from the trees by repeated jarrings, or by showering with hot water, and then destroyed upon the ground with a spade or the foot. It is not at all unlikely that when they found a scarcity of their favourite food, the balsams, they betook themselves to the spruce. Most insects when hard pressed will partake of other food than that which they usually prefer, particularly if it is from an allied species of tree or plant, and many, indeed, will eat almost anything. We should be much obliged to our correspondent if he would kindly send us some of the pupæ of these worms. He will probably find them amongst the leaves of the infested trees, or else upon or under the surface of the ground. They can be safely sent by mail, packed with a little cotton wool or other soft substance in a pasteboard box. Next year we should be glad to receive some of the caterpillars also, as the insect does not occur in our neighbourhood, and we have no opportunity of investigating its habits.

A New Insecticide.

M. Cloez, who is engaged at the garden of the Paris Museum—the world-renowned Jardin des Plantes—has invented what he considers a complete annihilator for plant lice and other small insects. This discovery is given in the *Revue Horticole*, with the endorsement of its distinguished editor, E. A. Carrière. To reduce M. Cloez's preparation to our measures, it will be sufficiently accurate to say, take 3½ ounces of quassia chips, and 5 drachms Stavesacre seeds, powdered. These are to be put in seven pints of water and boiled until reduced to five pints. When the liquid is cooled, strain it and use with a watering-pot or syringe, as may be most convenient. We are assured that this preparation has proved most efficacious in France, and it will be worth while for our gardeners to experiment with it. Quassia has long been used as an insect destroyer. The Stavesacre seeds are the seeds of a species of Larkspur, or *Delphinium*, and used to be kept in the old drug stores. Years ago they were much used for an insect that found its home in the human head, but as that has, fortunately, gone out of fashion, it may be that the seeds are less obtainable than formerly. The Stavesacre seeds contain *Delphine*, which is one of the most active poisons known, and we have no doubt that a very small share of it would prove fatal to insects.—*American Agriculturist*.

Correspondence.

The Thistle Nuisance

To the Editor.

SIR,—My object is to get a farm as soon as I think myself qualified. I have been serving a sort of apprenticeship during the past two years, and trust in another year to be able to start for myself. I have been carefully reading your paper since I have been here, and have anxiously watched for all that has been said about the Canada thistle. Recently I went to look at a very beautiful farm containing one hundred acres, but almost every field was badly infested with thistles. Now, your correspondent "Vectis" recommends that we plough the ground five times in one season, in order to kill them. This is quite a serious matter, especially for a young beginner. Fifty dollars' worth of labour, at least, for every ten acre field, not including rent, and then when the old stock of thistles is destroyed there is no guarantee that there will not be as many more spring from seed in two years hence. To see thistles growing in farmers' grain crops, as I have seen them do this year, affords a very discouraging and disheartening prospect, and if I cannot get a farm without thistles, I shall decline one at all, unless there is a less expensive way of dealing with them than the one "Vectis" proposes. At the beginning of last year, you had some articles in your paper recommending the dealing with this pest by thick sowing of clover, and stating that two crops of clover in one year would effectually destroy them, and I have heard from very good authority that this treatment has been successful. But one swallow does not make a summer, and I should feel obliged to any of your readers or writers who may have tried the clover system, if they would communicate the results in your journal.

ENQUIRER

CHICKWEED.—An "Inquirer" from Antigonish, Nova Scotia, complains of being greatly troubled with this weed, which he says utterly chokes out the growth of his garden vegetables. There are several plants known under the name of chickweed. There is a native sort called Indian chickweed, sometimes carpet weed (*Mollugo verticillata*), an annual common in light sandy soils where the ground is rich and well cultivated. It grows in small patches of branching stems with succulent leaves spreading out from a single root. Being an annual, good culture and constant care in preventing it from going to seed should get rid of it. We have found it more troublesome towards midsummer than at any other time, and if neglected it will cover the soil with a dense growth that chokes out everything else. The European plant known as chickweed (*Stellaria media*), which has already made its appearance in our gardens, is a much worse pest,

and being both biennial and annual is more difficult to extirpate. Its fructification is so simple, the seeds forming with scarcely visible flowers at all seasons, even under the snow, that it insidiously propagates itself in spite of every care to prevent. We know of no remedy short of sowing down the land, and pasturing it very close with sheep. A heavy growth of tares is recommended in England to smother it out. Buckwheat might do the same here, or clover. A good dose of salt, say a barrel to half an acre, might be tried, but we could not say with what effect. A dressing of quick lime applied in the fall or early spring, at the rate of twenty bushels per acre, might be also tried.

The same correspondent inquires what sorghum is. Technically speaking, this is the generic name of broom-corn (*Sorghum vulgare*), a plant well known as supplying the material of which the brooms found in nearly every house in Canada are made. A sweet variety of the same genus (*Sorghum saccharatum*), or the Chinese sugar cane, which some botanists assign to an allied genus, under the name of *Holcus saccharatus*, has been recently extensively used in Ohio and the Western States of America, in the manufacture of molasses or syrup. No practicable method has been discovered of crystalizing this syrup into sugar. The plant makes excellent fodder for stock.

The Canada Farmer.

TORONTO, CANADA, DEC. 15, 1869.

OUR NEW VOLUME.

This number of the CANADA FARMER completes the First Volume of our new series; and we think we may fairly claim to have more than fulfilled all the promises made in regard to it at the commencement of the year. Indeed, we have gratifying evidences of a good title to do so, in our large and increasing circulation, and in the hearty commendations of correspondents and cotemporary publications that come to us not only from all parts of the Canadian Dominion, but from Great Britain and the United States. We believe we have published, in the four hundred and eighty pages that compose the volume of 1869, a larger mass of valuable and interesting agricultural matter than was ever before furnished to the public in this or any other country for so trifling a sum.

And what we have done this year, we mean to improve upon in the coming one.

Our Prospectus for 1870 appears in another part of this issue, and we invite the attention of all our friends to the advantageous terms offered in it for the formation of Clubs and the supply of Agricultural Societies. We ask those interested in the advancement of Agriculture throughout the Dominion to aid us in the extension of our circulation. Any one is at liberty to get up a club, without reference to us. Whoever sends us a list of subscribers, accompanied with the cash, at club rates, will have the corresponding number of copies sent to such separate addresses as they may direct.

As we do not propose stereotyping the FARMER in future, orders for the new year ought to be sent in early in January to secure full fyles.

Notes on the Weather.

November, 1869, has been unusually cold and stormy, and large quantities of root-crops have had to be left in the field ungathered, the frost setting in so suddenly and severely as not only to freeze them fast in the ground, but also injure them so much that if a thaw set in, they would still have been of little value as food for stock. From the same cause, very little fall ploughing has been done, and cattle have had to go into winter quarters nearly a month earlier than usual. A good deal of snow has fallen, and sleighing has been fair through most of the country a few miles north of the lakes, while along the belt between the lakes and the limestone ridge formation, there has been but little snow. A heavy gale on the 16th did an immense amount of damage to shipping all along the line of navigation from Kingston to Lake Michigan, many vessels being totally wrecked, and several lives lost.

The mean temperature of the month has been 32° 7, which is 4° 2 below the average, and 3° 5 below the average of November, 1868. The highest degree of temperature was 58° on the 3rd, the lowest 13° on the 24th and 25th.

The amount of rainfall was considerable, though slightly under the average, being 2.540 inches, while of snow there have been 10.2 inches at Toronto, a very unusual amount for this month.

Rain has fallen on 9 days, and snow on 18. There have been two days clear, 7 partially cloudy, and 21 completely so. The prevailing winds have been North and West.

A Day of Thanksgiving.

From time immemorial it has been the custom among nearly all civilized nations to have at the close of their harvest a sort of general country holiday, or day of rejoicing and thanksgiving for the bountiful harvest and the termination of the husbandman's heaviest labours. In Europe the festival assumes the form of a "Harvest Home," while in the New England States it is called "Thanksgiving Day," and is looked forward to among all classes as the great day of the year, when the scattered members of a family gather together under the paternal roof, and after attending divine service in the morning to render thanks to the Almighty for his bounty, return home and spend the remainder of the day in temperate festivity and innocent social amusement. In New England this day is a fixed one, which has the advantage that it can be calculated on, and arrangements made by the various members of families for the annual gathering. The custom is much to be commended, as an acknowledgment of obligation to the Giver of all good, and as a means of promoting a kindly fellowship not only among those united by ties of kindred, but also among those who have been associated together as masters and servants, or employer and employed.

It is a subject of regret that in this country there is not a more general observance of a similar custom. Regarded in its subordinate character as a day of rest and social enjoyment, it is specially acceptable to farmers, among whom holidays are none too many, and one such, at a time of the year when the more pressing labours of the farm are ended, the weather pleasant and the roads good, would have a happy influence by promoting family reunions, and pleasant intercourse among friends and neighbours. And, looking at its highest end and meaning, the considerations which tell in favour of such a general acknowledgment of divine goodness are obvious and weighty. It is true, we have among ourselves days set apart for this purpose; but as each separate religious denomination appoints its own thanksgiving day at the bidding of some high official in its church, its recurrence is irregular and not sufficiently known, and few, comparatively, take any heed of the occasion; while by the community, as a whole, the day is virtually ignored. Surely, for an object of such national and common interest, the observance of one day specially set apart would be more securely than our

present practice of rendering our thanks by denominations, or neglecting the matter altogether. On many accounts a fixed date would have advantages, and a day towards the end of October would, probably, best meet the convenience of farmers and the requirements of the occasion. This is, however, a point of secondary importance, so long as the observance was simultaneous and national.

Western Experience.

While not a few speculators and chronically dissatisfied individuals are perpetually disparaging the agricultural and social advantages of Canada, and vaunting the superior attractions of the Western prairies, some wiser men amongst us, unwilling to accept such comparisons on hearsay, have by personal investigation examined into the actual state of affairs in that land of promise, and have returned with a thorough conviction that, after all, the Canadian will be greatly the loser by emigrating from his own acres. Many such evidences have come under our own personal knowledge, and the following statement of the results of a tour of observation, undertaken by practical men, with the view of determining the best course to be adopted by their sons, may be useful to others in a similar position of responsibility and doubt.

About two years since, the heads of three of our most wealthy families—men who are extensively engaged in manufacturing and farming, finding their children increase quite as fast as their capital, and feeling rather discontented with this "slow Canada," started off for the prairie country and the great American West, determined to see with their own eyes whether that country had advantages over Canada, and if it had, they decided to purchase properties there for such of their sons as might prefer it to their old home. These were really practical men, who had risen from very little to considerable wealth, who have large farms, factories and sawmills, all of their own earning, and who were not likely to be deceived or run away with by an idea.

They did not start in capitalist trim, appearing to have pockets full of money, but travelled in their workday clothes, and showed everybody that they met with, or who made any approaches towards their purses, that they knew the value of a dollar as well as any one, and that they were going to turn it over a good many times before they spent it. Where the country admitted of it, they travelled by rail, but when they came to the land in

which it had been represented to them that they should find the most fertile and easily tilled farms, they struck out and travelled on foot. They went many hundreds of miles among the prairie farms, enquired prices, cost of fencing, of buildings, of farming generally, and took a really practical way of ascertaining all the advantages and disadvantages of the land and situation. One of the brothers—there were three of them—who owned a grist mill, made a point of getting a small measure, possibly an ounce or so, but always the same quantity, of wheat from each farm they visited. He put this in a pocket prepared for it, taking care that the heat of his body should not dry or otherwise affect it, and at night the contents of that pocket formed a fair average of the quality of the produce of the country over which they had travelled. Another of the brothers paid special attention to the buildings and the cost of fencing, whilst the third examined the cattle, ascertained the cost of the necessities of life, and balanced the information he received against what he knew of Canada. In the evening of each day all compared notes. To their astonishment, they found that the grain was not comparable with Canadian grain—that the land, although so cheap, yet cost so much to break up and to fence, as to bring it, taking quality of course into account, certainly on a par with Canadian land—that all the dwelling houses were small and mean, and that farm buildings, even of the poorest kind, were the exception and not the rule—that most of the grain was stacked out of doors and threshed without cover, and that the stock suffered fearfully in the winter from exposure and destruction of their food, owing to want of proper barns, sheds and stables—that distances were so great that education for the children could not be obtained, and that the want of lumber and timber was so extremely serious a thing as not to be borne by any one who had lived in a timbered country—that want of wood for fuel caused great suffering, according to Canadian ideas, during the winter—and in short, that Canada afforded, either to the poor man or to the man with capital to invest in farming operations, quite as favourable a field, and a far more pleasant and comfortable one for a new home. They did not come to this determination till after months of travel, when they returned with their report to their expectant families, and very soon showed the young men that they could do as well, if not better, in all industrial pursuits in Canada as in the Western States, whilst in

point of health our country is far superior. They found great prevalence of congestive fevers and affections of the liver all through that country, caused by the continual chilly blasts of wind that swept over the prairies, and produced such sudden and continuous changes in the system that no constitution could stand it.

They also visited the timber country, where they found things pretty much the same as in Canada. The owners of timbered lands were fully alive to their value, and asked such prices as brought things to a level with those of Canada, while in all political and social matters they considered Canada far superior.

The following extract of a letter of advice, written to a friend, from one of our American exchanges, is singularly appropriate to the subject of prairie farming, and we recommend a careful perusal of it to any one who may think of emigrating to the Western States:—

"I once thought, as you seem to think, that it would be a very nice thing to be a farmer on the prairie. I was poor; I suppose you are. So I went to Illinois and tried it two years. I am cured, as doubtless you will be if you try it. That portion of Illinois—Coles county—in which I settled, was mostly in a state of nature, and its inhabitants mostly adventurers from other States, who, finding land very cheap, laid out all their money in lands, and in many instances went in debt largely for real estate. The consequences were that nobody had any money to operate upon, nothing with which to erect suitable and necessary buildings. In many places they attempted to farm without any fencing, while in others they had posts driven round and one plank put on. With stock roaming over the prairie, you may imagine what delightful work we had. We were all on a level. The man of means had brought himself down to the level of us poor by investing his all in lands, and he, like us, had entailed upon himself vexation of spirit; and, like us, he was bound hand and foot, unable to turn anything to advantage; and, like us, he at the end of the year found his troubles and his debts increased rather than diminished. After an absence of ten years I visited that neighbourhood the present spring, and found some of my old neighbours, after passing through all the years of 'high price' for farm produce, still involved in debt on account of injudicious investments in land, as above stated. There is one thing you may as well set down in your day-book, and that is, no one can succeed in farming on a prairie without capital.

You may ask: 'Where shall the poor go?' I answer—to a timbered country, where, upon your own land, grows the timber to make your own fencing and your own buildings; where you may, if you are not too proud, even erect your dwelling without any outlay except for the nails which tack it together."

We could give similar instances from American papers themselves, but this article is already extending to an undesirable length. We may just add that we spent six years of farm life in a portion of the West well settled, and altogether superior to that described above, and we unhesitatingly give the preference, after an equally long experience on a Canadian farm, to this country. While we were living in Illinois, we received a visit from an intelligent farmer from the neighbourhood of Hamilton, one who had cleared his own farm out of the bush, and by hard work had achieved independence and prosperity—who therefore knew all the hardships as well as the charms of a Canadian settler's life, and wished to ascertain if he could not settle his sons to more advantage in the Western States, of which he had heard so much. He visited Illinois, Missouri and Kansas, and after the most careful examination, gave up the idea of buying land in the States, and his sons are now all settled on Canadian farms of their own.

Our advice, then, to those who are dissatisfied with things here, and would rush to the other side, is, if possible, to "look before they leap," and at least, if they cannot make a personal investigation, to listen to those who speak from experience.

Organization among Farmers.

Experience has taught that concentrated effort, properly directed, is the surest road to success in any legitimate calling a man may adopt. In nearly every trade or profession except that of the agriculturist, we see that each and every member of that trade or profession co-operates with his fellows either to advance the spread of the particular knowledge required in his profession to the highest degree that it can attain, or in the case of trades, to unite together in establishing a certain arbitrary code of laws to regulate and control the prices to be paid for their labour, or the profits to be placed on the commodities that pass through their hands. Each manages, in some way or another, to get a voice in the control, not only of their own particular calling, but also in controlling and shaping the laws of the country to suit their own desires and convenience. Perhaps no class of men are so much in need of being thoroughly co-operative with each other as the farmers; and were they to be brought

to see the advantages that would result from organizing, they would endeavour to imitate the example set them by other classes.

The greatest obstacle in the way is that the farmers do not know their own interests. Whether the object be to assist each other in the way of getting information regarding the best stock, seeds, implements, machinery, or the means of obtaining labourers; statistics that will enable them to form a correct idea of the value of their grain and produce, and in a measure control the markets, and save themselves from the unprofitable directing of their labours, in growing an article that they must sell for less than cost of production; in controlling the action of the Legislature so as to prevent their being unduly taxed in order to enable the non-producing class, office holders especially, to enjoy immunity from taxation at the expense of heavier taxes on their lands and incomes, or to resist class legislation generally; work must be done and paid for, and they must, like other classes, be able and willing to give pecuniary support to their own organization; otherwise they must be content to remain at the mercy of those who are able and willing to control them. Legislatures are supposed to do business for the good of the country as a whole; but unfortunately they do not; and as they are controlled chiefly by individuals, corporations and combinations, the farmers, in order to protect themselves, have but to co-operate with one another in forming an organization of their own. And, as they virtually control the legislative action of the country, seeing they are the most numerous as a class, and own the principal interest in the soil which gives the right to vote to elect the Legislature, they have but to elect to the constituencies controlled by them such men only as belong to their own class, and can be depended on to see to it that the country is governed at an expense commensurate with its means, seeing that of necessity the whole expenses of government must come out of the soil and its productions.

The Southern States.

We have received the November number of a new agricultural paper, the *Rural Carolinian*, just started at Charleston, South Carolina. Its typography, paper, and illustrations are all of first-rate quality, and will compare favourably with that of the most pretentious of those got up in New York or Boston. No better evidence of the rapid recuperation of the Southern States from the de-

vacation and heavy losses caused by the late war can be found than is shown by the recent establishment of so many agricultural papers at different points. They are generally ably conducted, and contain a great deal of useful information adapted to the condition and wants of the South. Speaking of the future of Southern farming, the *Rural Carolinian* says: "The old plantation system must now be generally abandoned throughout the South. At present we are in a state of transition, and there is no little anxiety in the public mind in regard to the future. It will require all the wisdom that can be brought to bear upon it to secure a safe and efficient reorganization of our agricultural and industrial system." It advocates subdividing the great farms into smaller ones, more thorough cultivation and manuring, a wider range of crops, and especially extensive stock-raising, for which the ever-green pastures and mild climate of the South ought to be peculiarly favourable. Strange as it may seem, with abundance of labourers, they call loudly for more. They want workers where they now have but drones, for the negro is said to be for the most part incapable of appreciating the blessings of freedom, and to prefer idleness and semi-starvation to honest labour. If this be the case, it may be owing more to the degrading influence of long years of slavery than to any inherent indolence of temperament. In warm latitudes, moreover, we find laziness under white skins as well as dark ones. Land is cheap, very cheap, and the climate healthy and pleasant, so that we imagine if the tide of German emigration now going to the ague plains of the west could be turned southwards, they would find it a much more agreeable country than that to which they are now flocking.

Ontario Veterinary College.

It is gratifying to note the steady progress which this valuable institution is making, and the position of stability and permanence which it has now won. In 1862, Professor Smith, the energetic and indefatigable Principal of the college, to whose efforts its existence and prosperity are mainly owing, commenced a course of lectures to agricultural students on the veterinary branch of their profession; but it is only about four years ago that the regular course of instruction and examination was fully inaugurated. Since then, the College has granted diplomas to upwards of twenty well qualified surgeons, who are practising in various parts of the country with great success.

Every one of them, we are informed, is doing a good business, and there is no doubt that there is a wide and promising field for the practice of the profession in the Province of Canada.

The institution has from the first been greatly indebted to the fostering aid of the Board of Agriculture, and up to the present time the Agricultural Hall has been the scene of the oral instruction delivered. The need of a building specially devoted to the school has, however, long been felt, and at length this desirable object has been attained, and after the commencement of the coming year the lectures, pharmaceutical operations, and dissections will be conducted in a substantial and commodious building, which has just been erected for the purpose at Mr. Smith's own private expense, on Temperance Street, in this city. The building is of white brick with red facings, and presents quite a handsome appearance. There is ample accommodation for a dissecting room in the basement; on the ground floor are apartments for a resident keeper in charge of the premises, a room for pharmacy, and an office; and on the room above a spacious and well lighted lecture hall and museum. The whole adjoins Mr. Smith's veterinary stables, and the students will therefore have every opportunity for the practical study of their profession.

The new building will, it is expected, be ready for the opening of the coming term for junior students, on the 5th of January next.

We congratulate Professor Smith and his able and earnest coadjutors on the success of the institution, and the important addition to its efficiency which is now secured by the erection of this appropriate building. With the enlarged accommodation, no doubt, the number of students will be increased, and the country must ever be the gainer by the dissemination of sound medical knowledge and the training of skilled practitioners.

Farmers especially are interested in the advancement of veterinary science, and we would suggest to our agricultural readers that some of the younger men amongst them might very profitably devote the leisure of a winter to a term at the Toronto school, even if they had no intention of taking up the profession as a means of livelihood. A course of lectures to agricultural students is given at the University, as well as at the veterinary school, by Professor Buckland, and it is much to be regretted that a larger number of our young farmers do not avail themselves of the opportunity thus afforded of mastering the science as well as the practice of their noble calling.

Our readers will find in another column the advertisement of the *Hearth and Home*, a weekly family journal of great excellence.

Horticulture.

EDITOR—D. W. BEADLE,

CORRESPONDING MEMBER OF THE ROYAL HORTICULTURAL SOCIETY, ENGLAND.

The Refining Character of Horticultural Pursuits.

The following is an extract from the address of William Griffith, delivered at the first annual fair of the Lake Shore Grape Growers' Association:—

I regard the cultivation of fruits and flowers as the highest and noblest of all industrial pursuits, and as presenting the widest range for the operations of science and art.

The culture of fruits and flowers has been fitly declared to constitute the true fine arts. Every improvement, every new development, in the floral kingdom, or in the wide range of wholesome fruits, is attended with a corresponding advance in mental and moral culture, indicating the refining influence, the ever exalting tendencies of these Heaven-born pursuits.

By these associations man's coarser nature is modified and subdued. The baser passions are weakened, and the higher and nobler impulses are quickened and strengthened.

Developed amid these surroundings, a man is made a better man, and a woman becomes a better woman than she would have been without them. Elements of high culture are they, designed to make us happier and better.

Peering into the mysteries of plant life, the vegetable physiologist becomes a co-worker with his Maker, aiding in the expansion and propagation of flowers, shrubs, and trees, in adorning the landscape, and magnifying the grand and beautiful in nature, developing those glorious realities which demand and compel our admiration, and compared to which the types and shadows wrought with pencil and brush are of little moment.

Man, as he came forth from the hand of the Creator, was sent to be a gardener. God, his maker, having endowed him with a progressive nature, and comprehending all his aspirations, provided for him his garden home, domiciled him midst fruits and flowers, sweet savours and sweet perfumes, the choicest and purest of all his temporal gifts. Man, I repeat, was made a horticulturist.

The culture of the soil is our great first business, indispensable to the development of our race, necessary to our very existence. Human beings may exist—may in sparse numbers maintain for a limited time a bare foothold on the earth, without tilling the soil, but they can exist only as savages, uncultivated and unblest.

Cultivation of the soil means cultivation of the mind as well. "High culture" applied

to the soil finds everywhere its parallel in mental development. Hence it has occurred in all ages of the world, that in those countries and sections of country where the soil, favoured by climatic influences, was susceptible of the highest state of cultivation, science and the arts have attained the highest perfection.

But the grandest feature developed by the cultivation of the soil is that of horticulture. Those countries and sections of country where fruits and flowers abound in the greatest profusion, and where they attain their greatest perfection, are of all others the most desirable to inhabit, for they indicate plenty as well as beauty; they mark the culmination of the earth's unstinted bounty.

Such a constellation of high-minded, public spirited, self-sacrificing men as are found in the higher ranks of American horticulture can scarcely be named in any of the professional departments, and are only to be found, perhaps, among the missionaries of the Cross. A reporter of one of the New York dailies, who attended the biennial session of the American Pomological Society on the 15th, 16th and 17th of September, in the city of Philadelphia, where there were representative members from thirty States, as well as from the adjoining provinces of Canada, and where more than three thousand plates of choice fruit specimens were spread out, believed to aggregate more than two hundred bushels, with shrubs and flowers innumerable, and of exquisite beauty, and hanging baskets and running vines festooned and trained into the most beautiful forms that art could suggest, declared on his return to New York that he had been for three days surrounded with men of a higher order and of purer spirit and mould than he had ever met before—men who seemed to have given themselves up to the expansion of a noble enterprise with a devotion and zeal that to him was quite amazing.

Such are the effects said abroad, and such their influence upon individuals who have devoted themselves to the culture of fruits and flowers

Strawberries in Chili.

In no country in the world, perhaps, is the strawberry raised with so little trouble and expense as in Chili, South America. While we are blessed with a thousand and one different varieties, each one better than the other (were we to believe the propagators) there it is a berry, without godfather or godmother to endow it with a name or title.

It is from one to three inches in diameter, in shape oblong, round, cockscombed, crescent, twin-formed, and so on *ad infinitum*. Our learned men on this subject would say, that where there are so many different forms, there must of course be different species of the berry; but not of course, for I have counted from twenty to fifty berries on one plant, and every one presenting a difference

in some way. Its colour is a pale yellow; its flavour just tart enough to admit sugar being applied in so small a quantity as not to spoil the taste of the berry.

There are two ways of laying out a berry-patch in Chili. The one most in vogue is as follows: The ground is ploughed, or rather scratched over, for they still hold to the old wooden ploughs. It is then laid out in beds or rows, extending the whole length of the field, and from four to six feet wide, just wide enough to allow of picking the berries from the middle of the beds without trampling the plants. Between the beds is left a space about two feet wide, which serves the double duty of path and ditch, or water course, into which the water is led at certain seasons of the year, for the purpose of irrigation. Men are then set to work punching the beds full of holes in all directions, with no regard to uniformity of distance or straight lines. The punching is done with an iron instrument made like a marlin spike; the plants are then set, the dirt pressed around the roots, and the whole plantation flooded from the ditches. The water is not drawn off for forty-eight hours. Strange that they should grow under such treatment, but they do, and most luxuriantly. In six months' time the beds are one mass of plants: no weeding to be done, the growth of the plants choking out everything in the shape of a weed—at least I cannot account for it in any other way.

In nine months' time from the planting they come into bearing, and bear profusely, the whole surface of the beds perfectly covered with berries. Covered is no word for it. Imagine a bushel-basketful of the fruit dumped out on a space four feet square, and you will have some idea of what a Chili strawberry-patch looks like when in full bearing.

They commence ripening about Christmas. The first ones are generally sold on Christmas Eve. One berry placed in a small bunch of flowers will sell readily for five shillings. By New Year's Day they can be bought for sixpence per hundred—always sold by the hundred. No crops spoiled for the want of packages, and no competition between careless and careful packers, and the consumer knows that he gets all that he bargained for—the last berry will be as large and as good as the first. Generally, the berries are sold as they lie on the ground, at so much for the lot. The buyer provides himself with a dozen or twenty mules and *aparajos*. These last are crates or boxes made of cowhide, and formed by stretching them over a mould while green, remaining there until dry. Two of these being lashed together at the top, are thrown over the saddle of the mule, and will carry strawberries better than any other contrivance I ever saw. They will hold from two to three bushels each.

From five shillings per berry—price current at Christmas time—they decrease in value to two-pence per hundred. Think of

that, you who have to pay so dear for your fruit, 50 cents per quart, and Jersey quarts at that. All the berries you can eat for two-pence! For, do your best, a hundred Chili berries would be all that you could do away with at one sitting. The season lasts nearly three months; hundreds of bushels rot on the vines, as they have become so cheap that it does not pay to pick them.

The plants never die out or refuse to bear—at least I never knew of such being the case. The plantation once started, it is a perpetual source of income to the proprietor. Twenty shillings a year will pay all the expense of a forty acre lot, as all that is required is to see that the water is let on and off about once a month for six months of the year.

A. C.

NOTE.—The practice of irrigating the strawberry, as they do in Chili, may afford some of our cultivators of this fruit a valuable hint. It would be worth experimenting with where the means for so doing could be readily controlled.—ED. FARMER.

Why Noxious Insects Increase upon Us.

It is an old and very true remark that the various insects that afflict the gardener and the fruit-grower are year by year becoming more numerous and more destructive. One principal reason for this result is sufficiently obvious. The continual tendency of modern improvement is to concentrate vegetable gardens and fruit farms in certain peculiarly favourable localities, instead of scattering them evenly and uniformly over the whole country. Hence every injurious insect that troubles the gardener and the fruit-grower has an abundant supply of such vegetation as forms a suitable nidus for its future offspring close at hand, instead of having to search for it with much labour over an extensive surface of country. Such insects are therefore enabled by this means to increase and multiply with greater ease and greater rapidity. Upon precisely the same principle, if you scatter over the surface of a whole county the amount of shelled corn that is just sufficient to feed a certain gang of hogs, and compel them to seek it out and pick it up every day of the year, they will not thrive so well nor multiply so fast as if you feed out the very same amount of corn to them in a ten acre lot, day after day for a whole year.

To a gentleman in Arkansas, who had expressed the opinion that that State was the best in the Union for the peach and the grape, and that Illinois was not naturally adapted to the culture of fruit, Dr. E. S. Hull recently replied in the following masterly manner. We copy from the *Journal of Agriculture* for August 14, 1869:—

"Sir,—Your confidence in the superior adaptability of your soil and climate will probably not be maintained after a few years' experience. Just in proportion as you increase improved fruits, just in that propor

tion will you find fruit insects and fruit tree diseases increase with you. A recognition of this fact will each year, as you multiply your orchards, become more and more apparent. Your Hale's Early peaches at first will be free from rot, your pear trees measurably exempt from pear tree blight, your vines free from vine hoppers, the grapes free from grape codlings and rot, etc., etc. From some cause not yet well understood, all or nearly all young vineyards are for the first few years of fruitage free from rot, and then ever afterwards subject to it. The same is true of cherry, peach and plum rot. Therefore to those engaging in horticultural pursuits, a knowledge of the several difficulties likely to be encountered should be recognized, and so far as known, the remedies for each difficulty must be promptly applied.

"In this State, or in certain portions of it, many persons believe that horticulture is undergoing a great revolution, and ultimately that the business will be mainly in the hands only of the well-informed, those who understand and promptly apply the proper means. In view of known facts and observations, made during the past twenty-three years in this part of the west, and further south, I am convinced that all sections alike must recognize as facts these statements."—*Am. Entomologist.*

The Novice's Flower Garden.

It is to be regretted that midsummer is not the most appropriate time to plant flowers, and that many of them require to be set out in earliest spring, or even the year before they are expected to blossom. Drought is especially unfavourable to the sowing of seeds or transplanting of roots, and the drought that had already begun to distinguish this midsummer positively forbade immediate action. It had rained all through the spring as though the floodgates of heaven never were to be closed, but when finally they were shut down they fitted so well that scarcely a drop trickled through the cracks. May was a deluge; July was a drought. July came and went; August arrived and was slipping by, when at last clouds covered the sky, and rain began to fall. It is unnecessary to say that all such seeds as might by any possibility germinate so late in the season were, in spite of the gathering drops, planted ere the storm had fairly begun. Bridgeman had been learned by heart. Each kind was sown in a circle, and a sick with the empty bag, marked with the name, stuck up in the centre. The trough in which they were sown was dug about two inches deep, and then filled with manure to insure vigorous growth. Two inches is deeper than was authorized, but it seemed desirable that the plants should take a deep root. Hardly were the seeds planted when the rain stopped, the clouds broke, and the sun came out hotter than ever. For three weeks that sun never ceased to blaze except when

it went to bed—for three weeks not another cloud appeared or drop of rain fell.

Tending a garden is a pleasant occupation; but when the only thing to be done is to water, every morning and evening, a spot of bare earth where seeds are supposed to be, it is monotonous.

It rained at last, vegetation started in every direction, except where I supposed my seeds were. I watched my garden anxiously, visiting it early and late. At last a circle of beautiful delicate green began to show itself, not exactly in the place I expected, but not far off. My delight was unbounded. I watched that circle as a mother would watch a sick child. If the sun shone for two days in succession I watered it; if it rained too hard, I sheltered it.

That green circle grew slowly; the tiny leaves seemed to be feeble. I nursed them carefully through their infantile diseases, and when they were fairly past danger, and presented a circle of unbroken green, I invited Weeville out to smoke in my garden.

"Bate enough," he said, "plenty of waks and weeds, but no flowers this year."

"Wait till you see."

"I can see pretty well now; there is certainly nothing to obstruct the view."

"Look at that!" I said, exultingly, grasping his arm and facing him round towards the bed.

"Look at what!" he replied, staring stupidly about.

"At those plants. Are they not promising?"

"I don't see any plants."

"Not see any plants?" I replied, laughing at his ignorance. "Perhaps you cannot tell plants when you do see them; you must study Bridgeman. These are the beautiful *Aquilegia formosa*."

I did not know what they were, as the stick was gone, but this was the only name I could recall at the moment.

"May I ask," he replied, solemnly, "whether you are joking or crazy? What is it you are talking about?"

"Why, those *Aquilegia formosas*, that beautiful circle of exquisite green that I planted a month ago, and which assiduous care has finally brought to its present vigorous condition."

"What?" he demanded, in a surprised tone, "is that what you are talking of?"

"Yes," I replied, a little confused, but confident still.

"Beautiful circle of exquisite green!"—and he commenced laughing, and between the sobs of merriment came the half-intelligible repetition of "exquisite green!"

"Why, that circle of exquisite green—here he burst out again, nearly choked with laughter—"that exquisite green is nothing but a lot of wild carrots, that you have watered till you have washed all the life out of them."

What became of my seeds I never discovered. Certain it is that they have not come up to the present time. But the greatest mystery is, why should wild carrots grow in a circle merely to arouse hopes that were to be blasted?—*Five Acres too much.*

A Few Hints on Wine-Making.

BY GEORGE HUSMANN.

It has been our fortune, during a practice of nearly twenty years, to serve an apprenticeship in American wine-making, which commenced at the rudiments of the art, and we well remember how careful we were in picking our grapes to get them thoroughly ripe, and to keep out all dew or rain, and the doleful looks we would cast upon our imperfectly ripened grapes, as we did not think it possible to make good, drinkable wine from them. But fortunately those days are past, and we often think of them with mingled pity and amusement. Thanks to the teachings of Gall, Chaptal, and Pellet, we can now make good drinkable wine every year.

But we found that different grapes require different treatment, almost as varied as the grapes themselves. To elucidate this we would once more briefly allude to the definition of *boquet* and *aroma*.

Aroma is the flavour peculiar to the variety of grape; for instance, the *soxy* flavour so very perceptible as to be disagreeable in some of our grapes, especially the Northern Muscadine, Perkins, Hartford Prolific, and even in the Concord and Catawba.

Boquet is developed during fermentation by the action of the alcohol upon the acids. If the grape contains but little acid it can not develop much boquet, nor can it be developed if the must does not contain sufficient sugar to be changed into alcohol during fermentation. These simple facts we must keep before our eyes, as they are the most important guides in wine-making.

We have some varieties of grapes which will make so-called *aromatic* wines, that is the aroma of them is most pleasant when fully developed, which it can only be by thorough ripening of the fruit. In this class we can include the Creveing, Norton's Virginia, Hermann, and perhaps Clinton and Ives' Seedling. We should, therefore, let these ripen *thoroughly*, if we intend to make the best wine they can produce.

Other varieties we have which contain aroma in excess, and where it is desirable to have it in as slight a degree as possible, and to develop boquet instead. We can best attain this by gathering the fruit when not so ripe, as the aroma is then not so fully developed. Should the must not contain sugar enough, it must be added; and should the grape contain a surplus of acid, we can ameliorate it by adding water.

Among the varieties which will make the best wine if treated thus, we will name the Concord, Delaware, Diana, Hartford Prolific, Massasoit, Wilder, Lindley, Agawan, Merrimack, Salem, Rogers' numbers 8 and 12, and Telegraph.

This may appear startling to some of our readers, and for a long time we believed that it was necessary to ripen all grapes thoroughly to make the best wine from them. But "experience is the mother of wisdom."

We never made better Concord, Catawba, and Herbeumont, than in the season of 1865, when the summer was somewhat similar to the present one, when no grape ripened thoroughly, and our Concord must did not average more than sixty-five degrees, Catawba not over sixty, and Herbeumont not over seventy-five. By adding a gallon of water to the gallon of must, and sugar enough to bring the whole mixture to eighty degrees (on the saccharometer), we made a wine which we have not been able to surpass since, nor come up to it. Delaware made that season from half-ripened grapes was valued at six dollars per gallon within six weeks from the time it was made. It was a perfect wine then, clear and fine and with an exquisite bouquet. The Concord was without the offensive foxiness, and contained acid enough to be a very palatable wine, the best we have been able to make of that grape since.

In wine making we must always remember that we have no perfect grape yet; that grapes will, in different seasons, yield entirely different products, and that only *thinking, practice, and experiments* will teach us how we can best improve it.

In making wine we think it best now, after our experience of last season, to ferment each variety on the husks until the wine becomes perfectly clear and finished. Fermentation will draw out all wine-making ingredients, as acid, sugar, tannin, flavour, &c., and the husks will be perfectly tasteless.

Fermentation should be rapid and thorough, and the fermenting room be kept at an even temperature of sixty-five or seventy (Fahrenheit). Should it not be warm enough the room should be heated by a stove. Beware of cold cellars for young wine; they will retard fermentation and you will have continued trouble. Your wine should be clear, and all the sugar converted into alcohol, in three months from the making.

We hope we need not tell our readers that all their utensils, pails, vats, casks, &c., should be perfectly clean and sweet. A sloven has no business to be a grape grower, much less a wine maker, and does not deserve success.

We can, of course, only give general rules, but we hope that they will be sufficient to enable all of our readers to make their wine. They need not expect that they will reach the climax at once: it will take long years of patient study and experiment to produce the best wine a grape is capable of yielding. We do not pretend to know all about it; on the contrary, the more we learn we see only the more clearly how little we yet know. But we have made some good wines in our day, and do not fear any more that we will make a really or article. If these hints will enable our readers to do the same, we shall think ourselves richly repaid; and if they will now and then send us samples of their skill, we will try to give them our opinion and advice about it.

*The must is the juice of the grape.

Strawberries for Tea in October.

We are indebted to Mr. Whiting, the proprietor of the Mexican Everbearing Strawberry, for a basket of these berries, which we enjoyed with some friends at tea on the 20th of October. The perfume which filled the room was delicious. These berries had been gathered in Michigan, had been exhibited at our county fair in St. Catharines, and yet were very little bruised or mashed. In size they are not equal to most of the varieties cultivated in our gardens, yet large as compared with most of the Alpine sorts, and unusually long and cylindrical. These berries did not yield as high a flavour to the palate as the delicious aroma had led us to expect, and there was a dryness and pasty character to the pulp which reminded us of some Alpine sorts. How far that may be owing to the length of time that the fruit had been picked, we cannot say. At all events, if this do not prove to possess all the qualities to be desired in an everbearing strawberry, it is a happy starting point for the hybridizer, from which may yet come large and delicious strawberries wherewith to close the year.

Orchard Wind-breaks.

To the Editor.

Sir,—I propose setting out some trees as a shelter for my orchard, and wish to know what distances they should be planted from the fruit trees, and what distance apart. Is the Norway spruce desirable? Should there be more than one row, and if so, should the trees alternate, those in one row being opposite the intervening spaces of the other? How is the spruce propagated? Nurserymen ask fifty cents a tree, a price that makes it very expensive for a beginner. I wish to make an addition to my present orchard, and the locality is very much exposed, being in a level country, within two miles of Lake Huron, so that trees loaded with fruit are often damaged by high winds. Answers to the foregoing queries will oblige.

OBSERVER.

REPLY BY THE HORTICULTURAL EDITOR.—It is desirable that the evergreens planted as a wind-break should not be nearer to the fruit trees than thirty feet. They make a shelter much sooner if planted in a double row, the trees of one row opposite the spaces of the other, as our correspondent suggests. They can, if planted in this way, be set eight feet apart in the row, and the rows ten feet from each other. The Norway spruce is grown from seed, but unless "Observer" has had some experience in raising young evergreens from seed, he will not be likely to succeed in making any reduction in cost. Nurserymen will supply him with a quantity at much less than fifty cents a tree. The price is regulated by the size, but any of our nurserymen will furnish him trees two and a half feet high, if he will order a hundred or more, for twenty five dollars per hundred, and less for smaller size.

Girdled Stone Fruit Trees.

It will be in the recollection of many of our newspaper reading friends, that some time since an entire peach orchard at St. Joseph, U. S., was girdled in the course of one night by some fiends in human shape, who were determined to ruin the proprietor; the orchard contained over fifteen hundred fruit trees, peaches, plums, and cherry. There must have been several persons engaged in the outrage. The trees were all chopped round the stem, deeply, with heavy pruning knives, or light hooks. The bark was severed, and the cuts went deep into the wood. The mischief was accomplished, not by one cut all round the tree, but by repeated chops until all the bark was severed, and the chops opened downwards, the blows were all in a downward direction. The mischief was discovered the following morning, but the perpetrators were never found out. As soon as the proprietor found what had been done, he summoned the whole neighbourhood, who all turned out with a will; all the grafting wax that could be got together, or made on short notice, was prepared; the chopped bark was replaced as neatly as possible, bound up and covered with grafting wax, the outside of the wax and the neighbouring parts being covered with a plaster of cow-dung.

The owner of the property considered himself ruined. Many of the trees were girdled in two or three places, but all were bound up, and the damage repaired in the same manner. To the owner's great astonishment and gratification, the trees bore a most plentiful crop of the finest possible fruit, and the mischief is now entirely remedied; the wounds have healed, and nothing but a slight excrescence is the result. The girdling took place in the early part of June, and so great is the improvement in the orchard, that the owner now, (in advising his friends, at all events), advocates the practice and intends to try it on his own account on a future occasion. Doubtless he will not try it on a such a wholesale scale as was done for him, but he states that he is well convinced of the benefit which has resulted.

I had this information from a gentleman who has a large peach orchard immediately adjoining the property of the man who was intended to be so injured. My informant is a large peach grower, he sent two thousand three hundred baskets of peaches to the Chicago market this last season, and is now preparing to enlarge his peach orchard with 2,000 new trees. He has also been very successful in growing peaches, grapes, plums, and other orchard fruit in the township of Rochester, Canada West, where he has a large farm, and is now extending his fruit growing operations in that direction also. He has a large grown up family, and the various establishments are under charge of different members of it. He says that the fruit-growing capabilities of the dry lands in the County of Essex, Canada West, cannot be surpassed, and it only requires capital and industry to make fruit-growing in that part of Canada one of the most profitable pursuits in which a farmer can engage.

VECTIS.

Grape Vines.

There is an impression that has become somewhat prevalent, and that has been fostered by ignorant writers on the grape, that our hardy varieties are gross feeders, and require to be very highly manured. The very opposite is more nearly the truth. But a very few varieties will bear heavy manuring. Many persons have suffered severely from diseases of their grape vines which had their foundations in the too free use of manures. The immediate effect is to cause an exuberant growth of wood, which is very apt to be quite immature when winter comes, and if unripe will suffer more or less from the cold. Not merely does the portion that is quite green in October die outright, but that which has become brown and in outward appearance ripe, may be so porous and soft as to become affected by the severe frost of winter, so that the next summer the buds push feebly, mildew fastens on the foliage, neither fruit nor wood can come to perfection, and the vine is permanently diseased. If this result is not produced the flavour of the fruit is sure to be so affected as to injure them for wine, and the time of ripening materially postponed.

The vine only requires a soil that is in good heart, and if only a foot or two in thickness, overlying a limestone rock or shale, so much the better. When grown moderately, that is, naturally, the fruit ripens earlier and more perfectly, and is higher flavoured, and the vine is more healthy and hardy.

It has also been thought necessary to keep all the time pruning the vine, cutting off foliage as well as wood. This also is a great mistake. The grape vine should be so pruned in the latter part of March or first half of April as not to require any pruning in summer. Indeed, the practice of cutting away the foliage in summer is very injurious and often destructive to the vine, worse even than pruning in the autumn, and leaving the wounded plant exposed to the frosts of our severe winters.

It is of great importance to prune the vine properly. The fruit will be better, more abundant, and better ripened.

We hope every farmer in Ontario will take enough interest in furnishing a supply of this delicious fruit for family use to acquaint himself with the best varieties and learn how to grow them well. Whatever is worth being done at all, is worthy of being well done.

Washington Territory boasts of an immense cranberry marsh, yielding one hundred thousand bushels in a single crop.

Glass Houses—A Suggestion.

Why should not farmers who are well to do have a glass, or green-house, sufficient for all early things? The cost of it does not exceed four dollars a foot for its length. It may be made span-roofed, set north and south, so as to have the sun on each side of the roof during the day. Independently of the fruits, melons and other things of that kind which could be raised, large quantities of cabbage and cauliflower plants, celery, &c., and Swedish turnips could be raised for sale and transplantation. All the native American grapes could be grown in perfection, and if the house were not required for other things, an unlimited quantity of early poultry could be produced yearly. A house which would yield a considerable revenue in this way could be erected for the value of a span of horses and a waggon. Such a house requires but little skill to manage it, would be a constant source of profit and comfort to the family, and if made of the best and strongest glass would not be affected by hailstorms. Of course it would be a luxury, but it would be a very profitable one, and one which hundreds of our best farmers could well afford. It is this kind of thing which would raise the business of farming higher in the opinion of the public, which would create home comforts, and tend to keep the young men of the family at home, and make them farmers instead of shop-boys and clerks, or mechanics whose first move in life is to the States.

VESTIS.

Culture of the Hyacinth in Pots.

There are few, if any bulbs, which seem to be so well adapted to pot culture, or which may be reared with equal success, as the hyacinth, and certainly there are few which afford more gratification in their management. They will grow in almost any light sandy soil, but just in proportion as this is adapted to the plant, will the perfection of their culture be attained.

The pots, to bloom them in their greatest beauty, should be seven inches in diameter and the same in depth, but they will grow and bloom well in smaller pots, say four or five inches in diameter; only one bulb should be planted in a pot, but where there is little room to spare, three bulbs may be planted in the larger size. Put over the hole in the bottom of the pot a good drainage, half an inch or more in depth, and on this a handful of leaf mould, very old cow manure, or the coarse part of the compost; then add the prepared soil, filling up the pot to within an inch of the top. On this place the bulb, covering it with soil so as to leave only the crown of the bulb above it; press the earth in moderately firm, and give the pot two or three gentle knocks on the bottom to settle the soil, and finish with a good watering with a fine rose. Then select a dry spot in the open ground, where they can be pro-

tected with a hothead frame, plunge the pots three or four inches deep, and cover them to the depth of four or six inches with leaf mould, light sandy soil, or if neither are convenient, common sand will do, the object being to prevent the tops from pushing until the roots have made a vigorous growth.

If planted in October they may remain here till the middle of November, when they may be taken up, the pots washed, neatly surfaced over, and removed to the parlour or greenhouse, watering them sparingly at first, but increasing the quantity as the flower-stems advance, gradually inuring them to the sun, as the foliage will be white and blanched after remaining so long in the ground, and if too suddenly exposed to strong light, might be injured. As the flowers expand, a saucer may be placed under each pot, which may be kept filled with water until the flowers begin to decay, when the watering should be lessened, and gradually withheld altogether.

Successive plantings may be made every two or three weeks till Christmas, and treated in the same manner, guarding, however, against frost, when they are placed in the frame by a good thick covering of leaves, seaweed, or old hay, and covering them with boards or sashes to keep off the rain or snow. When there are only a few pots, they may be placed in a dark cellar, covering each bulb with an inverted pot, and watering them only once a week, until they have started sufficiently to remove to the parlour, where they may be treated in the same manner we have detailed above. If desirable to have them bloom late in the spring, they may be kept in the frame till April, if protected from frost, when, if brought into the greenhouse or sitting room, they will remain in bloom until those planted in the garden are in flower.

Strawberries.

A most excellent article on the general habits of the strawberry plant, from the pen of Mr. T. Meehan, appeared in the *American Naturalist* for August, from which the following is an extract.

"I have given particular attention to the strawberry for over twenty years, and am sure that 'Hybridization,' and the 'Gardener's skill,' in the production of varieties, are pure imagination. The gardener has 'preserved,' but he has not originated varieties."

He then goes on to describe the effect of the "runners" and the blossoms one on the other, and finally assures us, that just in proportion as we can check the growth of runners, we increase the growth of flower stalks; that the runners being, in fact, one means of reproduction of the plant, seems to interfere with the other means of reproduction in the berry. He says that throughout the Alpine and Andean ranges of mountains, and even on the Alleghanies in Pennsylvania, classes of strawberries are found which are more or less everbearing, and he considers that these

classes of the strawberry have been too much neglected. "They are excellent things in the amateur's garden, and there is no reason why they may not be an excellent improvement on others we have had."

Cultivators have always been told that the cutting of the runners from the strawberry plant was an improvement to its bearing, but have not been told why, and the consequence is that not one in a hundred of the garden growers, and none of the field growers, pay the slightest attention to the destruction of the runners.

If, however, it is true that by checking the mode of reproduction by runners, we increase the mode of reproduction by fruit and seeds, we have a reason at once given us why we should attend more closely to the destruction of the runners, and this will no doubt be done by those who arrive at the same result by the same train of reasoning as Mr. Meehan.

The grand effort of nature is reproduction, and if art can check it in one direction, and turn it into a more profitable channel in another, and good (i. e. profitable) results follow, the course recommended will soon become a general practice.

K. C.

Growing Mushrooms.

The following directions, from *Land and Water*, for growing mushrooms, are in accordance with those published some time since in these columns; but being, in some respects, a little more specific, they may be acceptable.

"The first thing required to form the bed is to get together as much short horse droppings from the stable, as fresh as possible, and some short dry manure from the heap, as will be sufficient to make the bed, when well compressed, sixteen inches deep, and of such length and width as may be required. I never make a bed of greater width than four feet, as it is more easy to gather from, and the length according to the requirement. Throw these materials in a heap, under cover, for a few days, to heat, and dispel the greater part of the moisture it contains; then spread it out for a day or two to cool down, after which again throw it up together for a few days—generally about five or six is sufficient; it will then be in a fit condition to wheel into the house to form the bed, which should, when well beaten down, be about sixteen inches deep. The great secret of success appears to me this primary operation, and to get it well together I put two or three men on to the job with heavy, flat-bottom wooden mallets, with which they hammer away on to the material as it is wheeled in. The reason for beating it down so firmly is, that the heat should be more lasting, and it is not so liable to rise too high at first. The thermometer is then inserted in the bed, and should be very carefully observed, for directly the temperature has risen, which it will sometimes do as much as ninety degrees, and again recedes to seventy-five degrees, it is then fit to spawn. It is very necessary to pay particular attention to this, as a temperature too high destroys the vitality of the spawn, whilst a lower one is not sufficient to produce the vigour necessary for an abundant crop. The best

spawn I can procure anywhere is "Cutbush's Milltrack," and for this I pay 7s. 6d. a bushel, half as much again as the common brick or patent spawn. I find that half a bushel of spawn is quite sufficient for a bed twelve feet long by four feet wide. It should be broken in pieces about the size of small apples, and inserted with the hands into the dung; after which cover the bed two inches deep with any good stiff garden soil, and well beat it down with the back of the spade. In about six weeks in the winter months, and perhaps a week or two longer will be necessary for the early and later beds, mushrooms will appear. One more point I am very particular about, and that is the mode of gathering. I never allow a knife near my mushrooms, for they can be easily detached by a gentle twist completely to the root, and if cut off, the stumps left in the ground decay and become the nursery of maggots, which will soon spread and destroy the whole of the succeeding crop.

Peach Orchards—How they are Raised

The stones, or pits, of the fruit are planted in the fall, come forth as young trees the following spring, are budded the first year, as soon as the season will admit; by good cultivation will often show fruit the third year, and bear a full crop the fourth year from the bud, increase in fruitfulness for about seven years, and as soon as the fruit gets at all smaller and later than usual, are cut down and succeeded by fresh plantations in other parts of the farm; so that a peach-growing farm is a succession of plantations, from the stone to the decaying tree. Of course, the land after the removal of the decaying orchard, undergoes renovation and rest by manure and other crops, until the ground, in the course of years, is able by restored fertility to bear a new plantation.

The product of a single grape vine of the Scuppernon variety in Jacksonville, Florida, this year sold for \$192.

The late severe weather has inflicted immense injury, far and wide, on the apple crop, the largest and finest, says the *Western Rural*, that has been seen in Michigan and Illinois for years.

The sunflower, from its supposed value as a disinfectant of the miasma causing intermittent fever, is to be extensively planted in the fever-stricken districts of Italy.

CUCUMBERS, MELONS, &c.—It is not generally known that all this class of plants can be raised from cuttings struck in bottom heat, or a hot-bed. It is a practice much followed in England amongst the market gardeners, and the gardeners of gentlemen's establishments. By this means plants can be obtained much earlier than from seed, and there are some kinds of fancy cucumbers which grow a yard long, and which will not produce seed readily, if at all, which are entirely propagated in this way. At Bishop Stortford, in England, there is a kind of cucumber of this nature, that is entirely grown from cuttings, and the vines are trained to the roof of the green-house. V.

Poultry Yard.

New York Poultry Show.

Before this issue goes to press, the second exhibition of the New York Poultry Association will have been held, as it is announced to open on Wednesday, the 1st of December, and continue till Thursday, the 9th. Among other special premiums offered is a medal, valued at \$80, for the best collection of Poultry "owned and exhibited from Canada." We fully appreciate the courtesy of this invitation to join in the competition, but doubt whether it is likely to meet with a response, for several reasons. First, there are few, if any, breeders in this country who keep so many as twenty distinct varieties; the fancy of most leading them to confine their attention to a few particular breeds. And secondly, the annoyance of the Customs renders it a most perplexing and difficult matter for any one not engaged in the trade to pass live stock over the border. Perhaps some arrangement may have been made to meet this latter objection; but it is probable that unless two or more exhibitors were allowed to unite to make up the required number of varieties, there will be no candidate for this premium. We understand that two Canadians have been requested to act as judges.

Breeding Poultry.

It is universally admitted that a continued system of breeding in and in, in the horse, cow, sheep or hog, is sure to produce deterioration. Not only is there a decrease of size, but tenderness of constitution and increased liability to disease.

One of our subscribers was recently telling us of the care he took of his poultry in this particular, not only every season to have a change of roosters, but also in selecting his own stock for keeping over the year, and in selling pairs always to couple those not akin. He informed us that while his neighbours had among their poultry rump, gapes, cholera, and other chicken diseases, his own flock was and had been entirely free from them. He considered this to be the cause, and there can certainly be no reason why the same objections to in and in breeding should not operate as with other stock.

We apprehend that in selling poultry, very few farmers take pains to pair them not akin, and, indeed, there is obvious difficulty in doing so, unless more system and method is introduced into the poultry yard, and more divisions than usual. We have occasionally purchased fowls from a party having a small enclosure, and who feeds high, retaining year after year the same stock. These are large and fine, but we have had them, without any previous warning, drop over suddenly, we presume from something like apoplexy.

The crossing of distinct breeds, making what farmers value as the barn-yard fowl, more hardy and better layers than some of the pure breeds, may operate in this way. It is a common remark with those who sell eggs and get their profit from them more than from selling chickens, that they get more eggs from mixture of breeds.

It may be well for poultry breeders to attend to this more than they do.—*Practical Farmer.*

Food for Fattening Fowls.

The best food for fattening poultry is sweet, fresh oatmeal or barley meal, mixed either with scalding milk or water. Cooped fowls should be supplied with fresh food three times a day, namely, at daybreak or as soon after as possible; at mid-day, and again at roosting time; as much as they can eat should be given to the fowls on each occasion, but no more than can be devoured by the next meal; should any be left, it should be removed and given to the other fowls, as, if kept, it is apt to become sour, when the birds will not eat it freely. The troughs for the soft meal should be scalded out daily, which can be done conveniently by having a supply of spare ones.

In addition to soft food, a supply of fresh clean water must be constantly present, and a little gravel must be given daily—otherwise the grinding action of the gizzard, which is necessary to the due digestion of food, does not go on satisfactorily; the supply of a little green food will be found very advantageous to health, a little sliced cabbage or some turnip tops, or green turf to pick at occasionally, being all that is required.

A variation in the diet will be found very conducive to an increased appetite, and therefore the occasional substitution of a feed of boiled barley for the slaked oatmeal is desirable. Some feeders have divisions in their troughs, or, still better, a small extra trough, which always contains some grains for the fowls to peck at.

Should the birds be required to be very fat, some mutton suet or trimmings of the loins may be chopped up and scalded with the meal, or they may be boiled in the milk and water preparatory to its being poured over the food, and the fat of fowls so fattened will be found exceedingly firm.

In the course of about a fortnight to three weeks, at the utmost, a fowl will have attained, under this system of feeding, the highest degree of fatness of which it is capable, and it must then be killed, for if the attempt be made to keep it any longer in that state, it becomes diseased from an inflammatory action being established, which renders the flesh hard and even unwholesome.

When the fowls have arrived at a state fit for killing, they should be kept for twelve or fifteen hours without food or water, in order that the intestines may be as empty as possi-

ble, otherwise the bird turns green and useless in a short time

In situations where good sweet Indian corn meal can be obtained at a low rate, it will be found to answer quite as well as oatmeal; it contains a very large amount of oil, and is invariably used in the States of America as a food for all animals put up to fatten. Wheat meal is too expensive, but some small fall wheat is far superior to barley to place in the trough as whole grain for the fowls to peck at.—*The Field.*

"All Eggs Laid will be Destroyed."

To the Editor.

SIR.—This is one of the rules of the Ontario Poultry Society, and of most others in England; from which they are only altered to suit local circumstances. Now, I should be glad to have the opinion of exhibitors generally as to the meaning of this rule. As I framed the first rules for the Society, I will explain my idea of its meaning, which is generally understood in all exhibitions in the old country to be—to prevent persons getting possession unfairly of any particular strain of fowls. It is, therefore, usual to crack the egg or run a pin into it; after either process it is useless for incubation. I do not think the literal meaning can be strained so far as to prevent an exhibitor having his own birds' eggs unbroken if he wishes. No society, of course, could take the trouble to collect the eggs for absent exhibitors; but if the exhibitor be present, and an egg is laid in any pen which he may own, I hold that on pointing out the same to the secretary, or other official, it may be given by those in authority to the owner of the fowls. This was done at most of our shows, and has given offence. It seems, in some quarters, but on what ground I cannot comprehend. The rule simply is a guarantee to absent exhibitors that the eggs their fowls lay shall not fall into the possession of others; but if the owner is present, and thinks the eggs of his stock of sufficient importance to be preserved, and takes the trouble so to do, through a proper official, I really can not see in what way the spirit and intent of the rule is violated. In two instances at an exhibition, I gave the owners of imported birds (at their request) the eggs laid. I took care to give them into their own possession, and not through a third party, and I cannot see, as some cavillers would have it, that the rule was broken.

F. C. HASSARD.

Ex-Secretary, O. P. S.

Feeding Chickens.

To the Editor.

SIR.—The oft-told tale must be repeated, and some of the most obvious rules reiterated, in order to keep poultry fanciers to the mark. Surely enough has been said on fowl and chicken feeding, and it should not require any repetition. Blair, Tegetmeier, Wright, and others, give all necessary direc-

tions. Why are they not attended to? Having constituted myself a sort of inspector—I suppose I might say spy—I get a look when I can, at this season, into my neighbours' yards. The view is not encouraging. I find chickens of six months old and upwards, no bigger than bantams, and the birds in general by no means satisfactory. I enquire the cause; I cannot get a reply; I then have to go into cross-examination, and find lack of food the chief cause in many cases, and especially the want of soft food. Keepers say they give every other thing *ad infinitum*, but lack this essential. Chickens will not thrive as they ought on hard grain. They must be kept growing from the moment they can run. In the long nights of the early spring, if required for summer shows, they must be led at night. But say they are not intended for anything but market, the sooner you get them there the better they pay; and if not fed in their earlier stages they never make good fowls afterwards. You never can put on in shape, constitution and frame, what you spoil by not feeding the fowls early. Chickens should be fed very often, and all birds should have a ration of soft food at least once in twenty-four hours. The noon-day meal is the best time.

It is a well acknowledged fact that feeding is the secret of the great weights—a little and often, varied as much as possible, is the way to ensure success.

Now, if exhibitions served no other end, they are of great use by causing comparison in this way, for I am certain that had a show of chickens been held this fall, some of our best exhibitors would have seen how lamentably deficient in size their birds of this year would have been, compared with many others better attended to and of younger growth.

F. C. H.

NORTH WESTERN POULTRY SHOW.—The *Western Rural* gives the following account of the Poultry Show recently held in Chicago.

"The third exhibition of the Northwestern Poultry Association was held in Library Hall, Chicago, on Wednesday, Thursday, and Friday, November 10, 11, and 12, and was in all respects a gratifying success. The entries comprised between 300 and 400 coops and cages, containing in the aggregate probably not less than 1,500 birds. It was by far the largest show of poultry ever held in the West, and nearly all the known breeds of poultry were represented. There were entries also of turkeys, geese, ducks, pea fowls, pigeons, rabbits, etc. The interest in breeding improved and approved kinds of poultry is evidently on the increase. The exhibitions of the Association have steadily increased in interest and magnitude, and we notice that the same state of things exists at the East. There is an increasing demand for pure-bred birds. The coops were arranged judiciously along the Hall, on long tables, and the birds disposed together according to class; the show was certainly exceedingly fine in quantity and quality."

Household.

Washing Dishes.

The Rev. T. K. Beecher gives his estimate and experience of the daily recurring domestic trial of washing dishes in the following characteristic style:—

The quiet fidelity with which "she" will dishwash her life away for "him" is a marvel of endurance and grace. Just here is the servitude of women heaviest—no sooner is her work done than it requires to be done again. Man works up jobs, ends them, and takes his pay. The pay can be translated into something else desirable. A man works all day, and draws pay for a day's work. This pay allures him, as oats a horse homeward bound. Thus men work by terms and jobs, and although work is endless as to quantity, yet when cut up thus into terms and jobs, we men go heartily on our journey and count our milestones.

Not so with our mates. "She" mends our socks, and we put our irrepressible toe upon the darned spot, and she darns it again. "She" washes for the family, and the family makes haste to send back the same garments to be washed again. "She" puts the room in order, and we get it ready to be "rid up" again. The same socks, the same washing, the same room every time. She has no successive jobs, no terms, no pay-day, no tally-stick of life. She washes the same dish three hundred and sixty-five times—yes, three times three hundred and sixty-five times every year. No wonder she breaks it and is glad of it. What a relief to say, "I've done that dish."

Not only have we washed dishes, but also we cooked and served and helped eat a meal—with bated appetite because of cooking—and now we are astounded at the number of thoughts, and steps, and acts, and processes involved in a very plain supper. Only two of us, jolly cronies, caring nothing for style and needing only a very plain supper. And we had it, and with it came wisdom.

Gentlemen, all! We go into a room and see a table ready set. It seems to us one thing—a supper. It is, in fact, from fifty to two hundred separate things, taken down one by one for use, and for "her" to wash and put back whence they came. There is a plate of biscuit. To that plate of simplicity, we with our hands and feet brought together a new, quick fire for baking, viz: kindling wood, raking out stove, and hod of coal. Flour from the bin, shortening from the gravy-drip down cellar, salt from one box, sugar from another, soda from the jar, acid (muriatic) from a bottle, a spoon, a pitcher of water, a dripping-pan, and a tin pan for mixing up these ingredients; and after all happening to forget the things for ten minutes, we burned the biscuit half through in a way which we men reckon quite unpardonable in a cook. Meanwhile that one

plate of biscuit added to the eternal dish-wash two spoons, two pans, one plate, and a little cup. Just a little piece of steak contributed eight pieces to the dish wash. A few strawberries sent in six pieces to be got ready to soil again. Four eggs impressed themselves on six separate articles.

Gentlemen, we began at ten minutes to six, and at a quarter to eight we found ourselves triumphant—everything cleared away except the dish-cloth. You see we washed up the bread-pan, the dish-pan and the siak, scalding them all—and our fingers too—and dried them off with the dish-cloth. Now, where on earth can we go to wash out that dish-rag? Not in the clean pan! Not over the clean, dry sink! We stood aghast for five minutes, then wadded up the rag, round like a ball, tucked it into the far corner of the sink, and shut down the cover. Our sink has a cover. But that rag, though hidden, was heavy on our conscience. "She" never would have done so. We have seen clean dish-cloths, but how they washed them passes our skill.

And so, as we said, "she" is always leading us to thought and good resolutions. We shall be a wiser and a better man for at least two days after her return. And whenever we stop to think, we rank a successful house-keeper and home-maker as a worker second to none on a scale of achievement and deserving. Her services are like the air, the rain and the sunshine.

Brewing Beer.

Canada is the only Province under British rule in which a man may not make the materials he requires for brewing his own beer. We trust this will be amended, and that the excise laws will be so modified that a farmer can make his own malt for his own consumption. He can grow his own barley and his own hops, which are the only materials besides water which are required for brewing, but he must not at present malt his own barley for home use, and this, it is to be hoped, will be modified.

However, as many old country men must have their beer, it may not be amiss to give practical directions for brewing. Whenever the legal disabilities as to making malt are removed or modified, it will be time enough to explain the process of malting, as adapted to the scale of the household.

It may be as well to observe that the writer is a regularly educated brewer—has brewed many hundreds of thousands of barrels of ordinary brewers' beer, and is quite *au fait* in every branch of the business. The object for a farmer is to brew a good, wholesome, table beer, of which a man can take a draught sufficient to satisfy his thirst, without muddling his brain, or otherwise overstepping the bounds of temperance; and it will be shown that he can do this without a set of brewing utensils, except those to be found about every farm house.

A large sugar or potash kettle will answer the purpose of a copper in which to heat the water, and also in which to mash the malt. If it has a spout and tap to it so much the better. If it has none, a substitute must be found.

Heat the water—good spring hard water—and let it boil: then let it cool down, or cool it down with cold water, to 160 degrees by the thermometer (Fahrenheit scale). A thermometer can now be purchased for less than fifty cents. When the water is 160°, check the fire down to a few embers or brands, then add the ground malt. The malt must, of course, be ground, and it should be coarsely ground, or if crushed only, so much the better, so that every grain is broken. Put in malt until when, mixed with the water, and after stirring for a quarter of an hour, the malt is just on a level with the water. Your boiler must not be more than half full of water when you put in the malt. When it is well stirred up, try it again with the thermometer. It will vary in heat according to the coldness of the malt, and the season when it is used, from 140° to 150°. If it is below 140°, add a little more fire, stirring the contents of the kettle all the while, until the mash gets to 145° or 150. Then put out the fire and stop up the stoke-hole with ashes, if the kettle is set in brickwork—otherwise keep the heat varying from 145° to 150°, and stirring all the time, if you keep the heat up with fire; but if the boiler is set in brickwork let it rest. Keep it at this heat for three hours, then lade all out into a fine sieve or basket, placed over a washing tub (well cleansed with boiling water and all the soap got out of it), until all the wort has run through the malt into the tub. It will be tolerably clear if you take care to keep the centre of the malt the lowest, so that the surface of the malt forms a kind of dish—it thus acts as a strainer for the wort. Ladle it all out until the kettle is empty, put some more water in the kettle, and heat as rapidly as possible; when nearly or quite boiling, sprinkle the mashed malt in the sieve or basket with the hot water, until what comes through has lost its sweetness. Take care to sprinkle all over the surface, and don't put too much at a time; a quart or so at once is enough, until you have used as much as you have obtained from the malt the first time. You will thus get out nearly all the goodness of the malt, and the rest that is left in it will do for the cow. As soon as you can empty the kettle of the hot water do so; the quicker the better; then put the wort out of the washing tub into the kettle and boil it up, putting in hops to the taste. Generally one pound of hops to a bushel of malt is enough, but one and a half pounds is better. The total quantity of wort obtained from a bushel of malt should be fifteen gallons. Bring the whole to a boil as soon as possible, but do not boil much; cover up close and leave it for an hour, just simmering. By this time you will have

washed up the basket or sieve, and got rid of the grains, and also washed out the washing tub; then place the sieve or basket again over the tub, and lade out the wort, hops and all, into the basket to strain out the hops. When all is out, sprinkle a little boiling water from the tea-kettle over the hops, to wash out the wort that remains in them—a quart will do—and the hops may then be thrown away, and the kettle washed out and put away. Now cool the wort in the tub as rapidly as possible; stir it well, and stand the tin milk-pail full of cold spring water in it, changing the water for fresh cold water as often as it heats, until you have the wort about as cold as milk is that has been milked half an hour.

You will, as a matter of course, have provided a cask to hold the beer. This must have been washed out with boiling water until sweet and clean, the steam stopped in with each washing, until there is neither smell or soil on the water that is used. You must also have provided some yeast—if you cannot get brewers' yeast, hop rising that you see for bread will do. Mix about a pint with the wort which you obtain from a bushel of malt, and then put all into the cask or barrel, which must be placed in the cellar. *Take care that the cask is not so full as to work over out of the bung-hole* and here I differ from all brewers I have ever known). If it works over, it only makes a mess, and the filling up does more harm than good. Let the beer work into itself in the cask. When it has fermented enough, the yeast will all go to the bottom, and feed the beer and keep it fresh and sparkling. You may begin drinking the second day; I always begin as soon as the yeast takes hold of it, but everybody does not like it so new. Stop the cask down, giving just vent enough to prevent its bursting, but a certain pressure should always be kept in the cask.

As malt is so dear, if you have, or can get sugar, add to the wort about half a pound to the gallon of wort, and you will then have a really wholesome, palatable, and good beer. If you want greater strength, add more sugar. If found too strong with half a pound to the gallon, put half that quantity; it is entirely a matter of taste and quality.

Now, I have brewed beer in this way for years; it is always good, keeps well, and remains sparkling to the last. When the weather is hot, keep the outside of the cask wet with water, and the evaporation will keep the beer cool and from souring. Some wetted straw, or an old sack hung over it, and kept wet by water dropping on it, will keep the cask and beer at the best temperature in summer.

Such beer as this never hurt any one. It is light and refreshing, and acts as a tonic rather than a stimulant. A few fresh hops put into the cask keeps the beer, lively and with a fine fresh flavour.

Toronto, Nov., 1869.

VECTIS.

Barreling Meat.

A subscriber asks, "Would it pay best to barrel pork or beef and sell in the summer, or sell the animals, either alive or in the carcass?"

Ans.—Few farmers have the facilities for fully carrying out the necessary operations of putting up meat in barrels, or understand how to do it in a way that will insure the article being of good quality to sell in a general market, and also keeping well. That business is now pretty well monopolized by the large dealers and pork curers at the great centres of consumption, who have such facilities for fully undertaking the business, and disposing of their stock, that they can afford to pay more for the animals or their carcasses than would probably be realized by the farmer or small dealer after going to all the extra trouble and expense of preserving and barreling.

In sections of country bordering on the great lumber regions, or near new settlements, where there is little or no stock which can be spared to make into food, while the process of clearing up the land and bringing it under cultivation is going on, a farmer who has a surplus stock of pork or beef to dispose of will make the most of it by salting down and selling it in the summer as the needs of the population may require. He would probably obtain nearly double the price for the salted meat than that he would have got for the animals in the cold season when fish and game are plentiful, and winter roads good.

Hair-oil.

The frequent use of "oils," "bear's grease," "arctusine," "pomades," "lustrals," "rosemary washes," and such like, upon the hair, is a practice not to be commended. All of these oils and greasy pomades are manufactured from lard oil and sandle hard. No "bear's grease" is ever used. If it could be procured readily, it should not be applied to the hair, as it is the most rank and filthy of all the animal fats. There are many persons whose hair is naturally very dry and crisp, and in most families there is a want of some innocent and agreeable wash or dressing which may be used moderately and judiciously. The mixture which may be regarded as the most agreeable, cleanly and safe, is composed of cologne spirit and pure castor oil. The following is a good formula. Pure fresh castor oil, two ounces, cologne spirit (95 per cent.) sixteen ounces. The oil is freely dissolved in the spirit, and the solution is clear and beautiful. It may be perfumed in any way to suit the fancy of the purchaser. The oil of the castor bean has for many years been employed to dress the hair, both among the savage and civilized nations, and it possesses properties which admirably adapt it to this use. It does not rapidly dry, and no gummy

offensive residuum remains after taking on the chemical changes which occur in all oils upon exposure to light and air. It is best diffused by the agency of strong spirit, in which it dissolves. The alcohol or spirit rapidly evaporates, and does not in the slightest degree injure the texture of the hair. This preparation, for dressing the hair of children or ladies, will meet nearly or quite all requirements.

A cheap and very good dressing is made by dissolving four ounces of perfectly pure, dense glycerine, in twelve ounces of rose water. Glycerine evaporates only at high temperatures, and therefore under its influence the hair is retained in a moist condition for a long time. As a class, the vegetable oils are better for the hair than animal oils. They do not become rancid and offensive so rapidly, and they are subject to different and less objectionable chemical changes. Olive oil and that derived from the cocoa nut have been largely employed, but they are far inferior in every respect to that from the castor bean.—*Boston Journal of Chemistry.*

Useful Receipts.

TO SOFTEN PUTTY OR PAINT.—Mix equal parts of good soap, potash, and slaked lime, add sufficient water to form a paste, apply this with a brush and let it stand some three or four hours, and your putty or paint will be softened, so that it can easily be removed with a blunt chisel. This is a good way to remove the paint from an old body.

VARNISH FOR COARSE WORK.—A cheap but good varnish for coarse work can be made in the following manner: Take of raw linseed oil 30 pounds, litharge 1 pound, and white vitriol half a pound; boil them together until the water is all evaporated. This is very durable, and costs but little trouble to make.

TO PRESERVE STEEL FROM RUSTING.—The simplest way of preventing the oxidization of polished iron and steel goods is to dust them over with quick lime. When articles are required to be preserved for many months, such as polished steel grates, strips of paper freely covered with powdered lime are to be wrapped around the bars, or they may be placed in cases and the interstices filled up with quick lime. Pianoforte wires and small goods are preserved in the same way. The rationale of the method is this—steel will not oxidate in dry air. The presence of quick lime, from its hygrometric properties, secures dry air, and thus indirectly the lime preserves steel from rust. This is not a new plan, but it is the method adopted by the majority of the Birmingham houses.

WATERPROOF TWEEDS.—The "Lounger" of the *Illustrated Times* says, "By the way, speaking of waterproofs, I think I can give travellers a valuable hint or two. For many years I have worn India-rubber waterproofs, but I will buy no more, for I have learned

that good Scottish tweed can be made entirely impervious to rain; and moreover, I have learned how to make it, and for the benefit of my readers I will give the recipe: In a bucket of soft water put a half-pound of sugar of lead, and half a pound of powdered gum; stir this at intervals until it becomes clear, then pour it off into another bucket, and put the garment therein, let it be in for twenty-four hours, and then hang it up to dry without wringing it. Two of my party, a lady and a gentleman, have worn garments thus treated in the wildest storms of wind and rain, without getting wet. The rain hangs upon the cloth in globules. In short, they were really waterproof. The gentleman, a fortnight ago, walked nine miles in a storm of rain and wind such as you rarely see in the south, and when he slipped off his overcoat, his underclothes were as dry as when he put them on. This is, I think, a secret worth knowing, for cloth, if it can be made to keep out wet, is in every way better than what we know as waterproofs."

TO REMOVE GREASE FROM LEATHER.—The white of an egg applied to the spot and dried in the sun. Or, two table spoonfuls of oil of turpentine, half an ounce of mealy potato, and the same quantity of Durham mustard. Mix these ingredients, apply to the spot, and rub off when dry. A little vinegar added revives it, and makes it perhaps more efficacious.

TO REMOVE STAINS FROM BROADCLOTH.—Take an ounce of pipe clay, which has been ground fine, mix it with twelve drops of alcohol and the same quantity of spirits of turpentine. Whenever you wish to remove any stains from cloth, moisten a little of this mixture with alcohol and rub it on the spots. Let it remain till dry, then rub it off with a woollen cloth, and the spots will disappear.

TO REVIVE FADED BLACK CLOTHS.—Boil two or three ounces of logwood in vinegar, and when the color is extracted, drop in a piece of carbonate of iron, as large as a chestnut; let it boil. Have the coat or pantaloons well sponged with soap and hot water, laying them on a table, and brush the nap down with a sponge. Then take the dye upon the table and sponge them all over with it, taking care to keep them smooth and brush downward. When completely wet with dye, dissolve a teaspoonful of saleratus in warm water, and sponge all over with this, and it sets the color so completely that nothing rubs off. They must not be wrung or wrinkled, but carefully hung up to drain. The brownest cloth may be made a perfect black in this simple manner.

HOW TO CLEAN OIL-CLOTHS.—To ruin them—clean them with hot water or soap suds, and leave them half wiped, and they will look very bright while wet, and very dingy and dirty when dry; and soon crack and peel off. But if you wish to preserve them and have them to look new and nice, wash them with soft flannel and luke-warm water, and wipe thoroughly dry. If you want them to look extra nice, after they are dry, drop a few spoonfuls of milk over them, and rub them with a small cloth.

APPLE JELLY.—Boil the apples until tender, and strain them. To every pint of juice add one pound of white sugar. Season with fresh lemons, or extract of lemon. Cook thirty minutes.

AMBROSIA.—Have ready a grated cocoanut and some oranges peeled and sliced. Put a layer of orange in your dish and strew sugar over it, then a layer of cocoanut, then orange, and sprinkle sugar; and so on, till the dish is full, having cocoanut for the last layer. It should be prepared an hour or two before it is wanted for use. Pineapple can be substituted for the orange; some use both, but it is better with only one.

HOW TO USE BUTTERMILK.—Place a common wire sieve over a pail, draw or turn the buttermilk into it, gently stirring the bottom with a spoon: what is saved in the sieve can be put into a jar, and when a quantity accumulates it can be stewed out by placing it in an iron kettle and simmering slowly until the oil or butter rises on top and the sediment settles to the bottom. It makes good shortening for pie crust, and where there is a large dairy it may be used to fry in. Before it is fried it makes excellent cream biscuit.

ECONOMICAL USE OF NUTMEGS.—If a person begins to grate a nutmeg at the stalk end, it will prove hollow throughout, whereas the same nutmeg grated from the other end would show sound and solid to the last. The reason is that the centre of the nutmeg consists of a number of fibres attached to the stalk and free at the other end; if, then, these are detached from the stalk they drop out; but if the grating commences at the other end they will adhere to the last, and be pulverised with the rest of the fruit.

Unskilful Temper

BY HENRY WARD DEECKER.

One would think that there could be no end to the resources of anger. Men use it in so squandering a way, that one is surprised that the stock does not run out. But even this wastefulness of the precious commodity is not so censurable as the want of skill and good taste with which it is employed.

It is not economized. It is not put to good purposes. It is squandered. It is not skilfully shot out, as a marksman shoots at a target. Indeed, men show clearly enough that they do not know the value of anger. A good article of anger is worth far more than Hazard's or Dupont's best powder, and ought to be used with an economy at least equal to that of the sportsman, who never burns powder needlessly. What should be thought of a sportsman who should go on firing his gun out of the window, without aim, in a general and universal way? Or what of one who should go about the yard, the garden, exploding his gun every hour into the air, hitting nothing? Yet so do men let off the precious force of temper—the invaluable treasure of anger.

Is anger a virtue? Certainly. Or why should it have been said, "Be angry, and sin not?" One who cannot be angry can hardly be virtuous. "Abhor that which is evil, and cleave to that which is good," is a complete account of moral excellence. That love of good is to be suspected which has no hatred of evil behind it. Like a coin, Virtue should have love of good on one side, and hatred of evil on the other.

Dr. Arnold, of Rugby, used to say, that he was never sure of a boy until he found that he hated wickedness. It is for this that anger is given us. It is not a pop-gun for amusement, or a Chinese cracker for holiday uses. It is a weapon carried about the person, in dangerous times, to defend one's life and honour with.

It should be used sparingly, and then always with an aim.

We have seen sportsmen, young and green, who carried their gun cocked; so that in getting over a fence, or rushing through a thicket, they were liable to have it discharged unawares. Just so we see men carry their tempers. They are fired off for them, and even upon them.

But a man's temper should be like the trigger of a western rife. There are two triggers. Until the forward one is drawn, the other is useless. But as soon as the forward one is drawn, the second one is set so delicately that the touch of a hair will discharge the piece.

Men should have a guard trigger to their tempers. No matter how easily you go off when the time comes for it: But every man's temper should be so arranged as to remain firm until he sets it, on purpose, and takes aim. And when he has fired, he should, like a gun, be fired all over, and all through, so that nothing is left to go off till it is loaded again.

A correspondent of the *Country Gentleman* says that rubbing the infected parts of the body with coal oil, is an effectual cure for the injury done by the poison vine.

CIDER MILL.—A correspondent from Trafalgar wishes to know of a cider mill "superior to those in common use." We cannot tell what kind he is accustomed to, but can recommend those manufactured by Sells, of Vienna, which have repeatedly gained prizes at Provincial and other exhibitions, and are generally highly esteemed.

TO COLOR YELLOW ON COTTON.—Wet six pounds of goods thoroughly; and to the same quantity of water add nine ounces of sugar of lead, and to the same quantity of water, in another vessel, add six ounces bichromate of potash. Dip the goods first into the solution of sugar of lead, and next into that of the potash, and then again into the sugar of lead. Wring out dry, and afterwards rinse in cold water.

REMOVING HAIR.—A correspondent from Dawn wishes to know "if there is any means of destroying the bulbs of human hair, so as to prevent its growth, and at the same time not be injurious to the skin." If the portions of skin from which it is desired to remove the hair be of small compass, as from a mole, for instance, perhaps the most effectual means would be to pull out the hairs with a pair of tweezers. Where this is not practicable, there are certain preparations, termed depilatories, used to effect the same end. The principal ingredient in all these is quicklime. Care should, however, be exercised to avoid the caustic action of the lime on the skin—ordinary caution will prevent this. The following formulary for the purpose is given by an eminent French physician. Lime 5 parties, soda 10 parts, lard 40 parts. Mix and apply as an ointment.

Apiary.

How Much Honey to Winter a Swarm of Bees?

The question is often asked, how much honey will winter a swarm of bees? The following, taken from my memorandum, will assist the inexperienced, showing not only the amount used from December 1st to about the middle of April, but also the difference between the winter months, when they are breeding but little, and later when breeding is going on rapidly:

My bees are wintered in a room about ten feet square in the second story of a large building. The room is double-boarded, with a space of four inches between, filled with tan. Ventilators are so arranged as to be controlled from the outside, without entering the room.

Nov. 27th, 1861, bees were weighed and housed for the winter. March 9th, 1862, they were carried out and placed on their summer stands. March 12, weighed again. Average loss, per swarm, in 105 days, 10 1-10 lbs.; greatest loss, 15 lbs.; least loss, 6 lbs.; average daily loss, per swarm, 1 1/2 ozs. April 12, weighed again.—Average loss, per swarm, in 31 days, 4 lbs. 13 ozs.; average daily consumption, per swarm, 2 1/2 ozs.

Dec. 2, 1863, weighed and carried in bees. March 5th, carried them out. Weighed again March 11. Average loss, 10 lbs. 3 ozs. in 99 days; greatest loss, 16 lbs.; least loss, 8 lbs.; average daily loss, about 1 3/4 ozs. Weighed again April 9. Average loss in 29 days, 4 lbs.; average daily loss about 2 1/2 ozs. Previous to the last weighing, they were fed freely with rye meal, and carried in perhaps one pound per swarm, which would make the loss 5 lbs. instead of 4 lbs.

In this locality bees do not usually carry in even pollen until about the middle of April. Nothing is added to their weight except what is given them. The amount consumed during the winter months is mostly honey, as not much breeding takes place, but after being carried out early in March, they begin to breed rapidly; and, of course, draw largely upon bee-bread.

About the 20th of February, 1867, I weighed three swarms, which had been housed from early in December. They had become only about three pounds lighter, each. They were young swarms, and rather below medium.—*Cor. American Bee Journal.*

Bee Feed.

A correspondent in the *American Bee Journal* gives the following directions on the subject of artificial feed for bees.

"Since bee-feed seems to range almost from lager-beer up to pure honey, and from wheat flour down to oat meal, I will, with your permission, also give the readers of the *Bee Journal* my method of feeding—premising that, as honey is pure food for bees, we should feed no impure substitute.

"I take eight pounds of coffee sugar, add seven pounds of boiling water, and evaporate one pound—making fourteen pounds of syrup, measuring about ten pints. Thus I make by weight any amount needed: set it by in crocks; and feed, by measure, to each stock the quantity it needs. In my estimate I have always counted one pound of sugar thus fed equivalent to one pound of honey.

Poetry.

The Land of my Birth.

Old England for ever!
No power shall sever
My heart from the land of my birth.
'Tis the land of the brave,
Which none can enslave,
'Tis the happiest land upon earth.

'Tis the land of the free.
So it ever shall be;
Her children no fetters shall bind.
Ere Britons are slaves,
We shall sink in the waves,
And leave not a vestige behind

If the African stand
But once on her strand,
That moment his shackles are broke;
A captive no more,
He leaps on the shore,
And shakes from his shoulders the yoke

'Tis the land of the brave,
And the patriot's grave,
And heroes and sages of old.
We hallow their dust,
And esteem it a trust
More precious than silver or gold.

'Tis the land of the fair,
And beauty is there,
And the gladness that woman bestows,
When the circle is bright
With the heart-cheering light,
From the eye of affection that glows.

'Tis the land of the wise;
With the glorious prize
Of genius her temples are bound,
And she beams from afar,
Like the bright morning star,
To give light to the nations around.

Autumn Thoughts.

Still falls the leaf on golden sheaf,
The harvest suns no longer shine;
In ruddier brown their bosoms go down,
And ruddier tinge the far sea line.
Ah! each fair fading of the day
Shows plainer yet the year's decay.

Soon from the west, in angrier quest,
The chariots of the wind shall sweep;
Soon, down the shore, with hoarser roar,
Shall sound the trumpets of the deep,
Till autumn's vesture disappear,
And the dark storm-cloud's path be clear.

Then, while her eyes to leaden skies
The patient earth no more may raise,
E'en tempests' power in that dread hour
Shakes not her hopes in gladder days.
She deems that spring will come anew,
And deck her in fresh robes of dew.

So, o'er our soul when thick clouds roll,
And youth's bright pageants sink in shade;
When, pressed with care, we woo despair,
As dreams we closest cling to fade—
Let some such gracious thought of spring
Be hopeful to our imaging.

Fraser's Magazine

Agricultural Intelligence.

United States Agricultural Report for 1869.

A preliminary report of the condition of the crops has been issued by Commissioner Capron, of the Department of Agriculture in the United States, from which an approximate idea may be had of the results of farming operations throughout the country for the year. From the data thus furnished, the following synopsis is given in the *Western Rural*.

"It is not an exaggeration to estimate the reduction this season, from alternate drowning and scorching of farm crops, at \$200,000,000. The general apprehension of various failures in the corn crop of the more northern States, has, however, been materially modified by the sunny weather in September, and exemption from killing frosts to October 1st. Early frosts in some portions of the Eastern and Middle States, checked the ripening, and left the frost-d fields in an immature and damaged condition, but the injury is comparatively slight in extent and limited in area, as the whole crop has had an unusually favourable maturing season, resulting in the very gratifying amelioration of prospects for the supply of this important staple. Yet a full crop can by no means be expected. When the harvest is over and the local estimates are completed, the aggregate will attest a moderate yield, amply sufficient for all the wants of the country. Had the Spring wheat been equal to the Winter, the whole crop would be enormous. Throughout the South the yield is unusually large and the quality excellent. Texas and Mississippi are somewhat less conspicuous sharers in this improvement than the other States in that section. In Illinois, the counties reporting an increase equivalent to ten per cent. or more are almost without exception in the southern part of the State, below the 40th parallel, the Winter Wheat region; those claiming eight-tenths of a crop, are, with one or two exceptions, Spring Wheat counties. Indiana grows a large proportion of Winter Wheat, and consequently this year produced a much better average yield than Illinois. Many of the counties return high figures. The report says that the great agricultural lesson of the season inculcates the necessity of draining and thorough culture.

"The area of cotton cultivation was increased last spring sixteen per cent. More than a million acres were added to the cultivated area. Fertilizers were liberally used in the Atlantic States, and improved implements were to some extent employed.

"Rarely has there been a better season for oats than the present, very few of the States returning an average of less than ten per cent., and some giving thirty or thirty-five per cent.

"The season has been too dry for either kind of potatoes in the South and on the Atlantic coast to New York. New England generally has a good crop, and it is unusually good in the West, with the exception of Minnesota. The production of sweet potatoes is manifestly increased.

"A slight increase in the aggregate number of fattening cattle, as well as in their average condition, is reported. Several of the States fail to maintain a fall average, among which are New York, New Jersey, Kentucky, and Illinois."

Georgia State Agricultural Exhibition.

That agriculture is receiving a new impetus in all the Southern States is evident, not only from the number of new periodicals devoted to the subject, but also from the great interest manifested in the various agricultural exhibitions during the present year. Among others the State Fair in Georgia, held in Macon, on the 17th of November, and following days, is reported as having been eminently successful. Upwards of 15,000 persons visited the grounds on the first day, and the number of entries was larger than at any previous exhibition in the State. Commissioner Capron delivered an eloquent address on the occasion, in which he dwelt especially on the altered condition of labour in the South, and predicted the rapid advance of agriculture as one of its fruits. He justly observed that:

"The change in the labour system involves a radical change in the manner and appliances of cultivation. Free labour, to be most efficient, must be educated labour—in a certain degree skilled labour; it must be supported and supplemented by improved machinery, so that every dollar expended in the exercise of human muscles may become two by the magical augmentation of rural mechanism. It is thus that our lands must be cultivated and crops grown, in part by *braves*, in part by *brains*.

"This change in labour also involves the necessity for smaller farms, better culture, the use of manures, rotation in crops, and a larger working capital in proportion to permanent investments.

"As a natural sequence to this system of industry, variety in production will take the place of an unceasing culture of cotton and corn."

The address was altogether worthy of the occasion, and the dissemination of such sound and enlightened views cannot fail to promote the peaceful triumphs of agriculture in the growing wealth and stability of the community.

The apple crop in Welland has been almost entirely destroyed by the night frosts which have recently been so prevalent. A small proportion of the crops has been secured comparatively safe, the pomologists having in some instances, shaken the fruit off the trees into the snow for the purpose of protecting it, but all that was permitted to remain on the trees has been hurt.

THE SMITHFIELD CLUB CATTLE SHOW FOR 1869.—The Smithfield Club have issued their programme for the forthcoming cattle show of the present year, which they have appointed to open at the Agricultural Hall on Monday, the 6th December, and to continue the four following days. The president of the club for the present year is the Duke of Marlborough. The money prizes to be awarded amount to £2,120, namely—£1,365 for cattle, £620 for sheep, and £135 for pigs. There is, however, a large increase in the prizes in the shape of plate, medals, &c. In addition to the ordinary silver cups, the Council have determined on awarding a piece of plate, of the value of £100, to the best beast in the show—extra stock included; a piece of plate of the value of £50 to the exhibitor of the best pen of sheep in the show; and of £20 to the best single sheep in extra stock—besides the gold medals to the breeder of the animal winning the silver cups for best specimens of cattle and the usual silver medals. These bring the gross estimated value of the prizes to be awarded at the ensuing show up to a sum of £2,500.

Potatoes are so cheap in Iowa that many acres are left undug.

150,000 persons visited the Buffalo Industrial Exhibition.

Corn sells at a higher price than wheat in some parts of Indiana.

California exports silk-worm eggs to Italy and France. They are sold at \$10 per ounce.

The total receipts at the St. Louis Fair Association at the late Fair were \$66,100, over \$10,000 in excess of last year.

A large amount of tobacco has been badly damaged by freezing, all through Indiana, Illinois and Northern Kentucky.

It is estimated that over a million bushels of peaches were shipped from Alabama during the past season.

One of the Sandwich Islands claims to have the largest orchard in the world, some of the trees bearing fifty barrels of apples.

The corn crop in some parts of Pennsylvania has suffered severely from the ravages of the white grub. In many places it will be an entire failure.

The crop of potatoes in Prince Edward Island is immense and the farmers have to ship them as quick as possible to Halifax, where they sell at thirty cents a bushel.

Sunderland cattle fair, held on the 28th ult., was well attended, and a large number of fine cattle changed owners. Mr. Gould drove off 72 head of capital beasts.

At a New England county fair the receipts were so much below the expenses that only sixty cents on the dollar will be paid on the premiums.

The annual fall cattle fair held at Gloucester on the 3rd instant surpassed anything of the kind in the Province. Upwards of 2,000 head of cattle were on the ground, and more than half of them changed hands mostly to distant buyers.

The average home production of wheat in England for the past three years is stated at 12,278,666, and the importation at 8,413,312 quarters.

There are 3,000 cotton and woollen factories in the United States. In the Southern States there are 87 factories, with 221,000 spindles, and many others are erecting.

Many apples have been frozen on the trees, and are unfit for market. They may appear to be sound, but on cutting them they will be found to be more or less discoloured, and will not keep well.

There is a colony of Japanese in California, who, it is said, will give their attention to the culture of the tea plant and of silk. They think that the soil and climate are well adapted to the tea plant.

About 400 head of cattle were on the fair grounds at Teviotdale on the 29th ult., and about 150 changed hands. Good yokes of oxen sold at about \$76, and one yoke at \$115, while cows averaged \$22.

Two thousand people attended the Arkona cattle fair, and over \$6,000 of outside capital went into the pockets of the farmers of Rosanquet, Warwick and Plympton. Nearly 800 cattle were on the ground, and over 200 were sold to buyers from a distance.

The Early Rose potato has not done well in England. Loud complaints are made of its being a swindle. It appears, says the *Western Rural*, that English potatoes fail when grown in America, and American potatoes that do well on this continent are of little or no account in Europe.

The surplus of the Minnesota wheat crop for this year is estimated at 15,000,000 of bushels; and yet not one-tenth of the great wheat plateau of that State has been brought under cultivation. One farmer, the past season, harvested 1,000 acres, with an average of forty bushels per acre.

The castor bean, from which the oil is made, is becoming an important industry in Perry county, Cal. One prominent dealer received at his warehouse 1,000 bushels in one day, paying \$3 18 per bushel. It yields more bushels to the acre than wheat.

The farmers of the county of Carleton have set forth in a petition that when returning from markets on Saturday nights in winter, they are debarred from warming themselves in the roadside bar-rooms after seven in the evening, and they ask the Local Legislature to extend the hour to nine o'clock.

The Six Nations held their annual agricultural exhibition in Tuscarora on the 14th and 15th Oct. The show of horses and cattle was very good, and would have done credit to any county exhibition. A grant of £20 sterling has been made to the Six Nations Agricultural Society by the New England Company.

The *Waterloo Chronicle* says many thousands of bushels of apples were destroyed during the last month by frost. The farmers talk of grinding them up at once for cider, and making apple butter of them, but, however, they may manage to save a part of the loss, apples proper, will be both scarce and dear this winter.

The last Elora monthly fair was very dull as to sales. Hardly a score of cattle changed hands. The large fair ground was covered with cattle, horses, sheep, etc., but buyers were few and far between, and showed no desire to purchase. The majority of the cattle were small, and only in condition to feed, and the few buyers present would not touch them.

The London General Omnibus Company reports a saving of £28,000 per annum on the feeding of 6,000 horses with maize instead of oats. The experiment has been tried during eighteen months, and the improved condition of the animals is as remarkable as the saving.

The wolves are becoming very troublesome in West Garafaxa, as well as Luther. A correspondent of the *Fergus News* says Mr. Wm. McMullin had six sheep killed and three more almost worried to death by these voracious animals, on the night of Sunday, the 25th of October. The wolves are also getting very bold through incessant plunder, even daring to show combat with the lords of creation. A case occurred of a man and his wife being attacked while returning from a neighbour's one night lately. They had to turn back; and get torches; and on coming to the same place again they found the wolves waiting for the affray, and keeping up an unearthly howling. But the quadrupeds had to yield and acknowledge the bipeds masters of the situation, though they did so slowly and reluctantly. No loss on either side. Sportsmen cannot sight a deer this fall; but numerous skeletons are to be met with in every direction, indicating that the wolves commit, fearful devastation among the innocent creatures. There are eleven Nimrods from Elora encamped in the neighbourhood of Hungry Hollow, but their luck has not been sufficient to repay their toil, as yet.

Miscellaneous.

The Dignity of the Farmer's Life.

There is a higher dignity than that of poetry or painting that attaches to the farmer's profession—a dignity which should make him walk as erect and look the blue heavens as proudly in the face as any man who treads the earth. No industry to which human hands were ever set since the first pair were made is deserving of higher estimation than his, for, of all the toilers of the earth, he stands in the closest copartnership with Divine Providence in its realm of nature. See now the conditions of this copartnership, the capital which each invests in one summer's crop. Here, for example, is a cultivated farm of one hundred acres of land. The Creator might have made that land bear stout crops of wheat and corn all of itself, without man's help, but He did not, and would not. He condescended to admit man to a partnership with him in variegating the verdure of those acres, in covering them with waving grain and yellow harvests. He would not let nature produce any crops for human sustenance without the co-working of human sinews. The wheel of the seasons might turn on for ever scattering rain, dew, light and heat, and every germinating influence; but unless it was belted on to man's industry it would not turn out a sheaf or a loaf of bread. But see what comes of the connexion when a pair or two of hands and hopping hearts join their activities to the revolutions of that wheel. How generously nature divides with man the honour and joy of the crop. How she works with all the

sublime and mute economies of the seasons in this partnership of toil. The very shape of the earth's orbit, and all its million-miled many stages round the sun, as well as the fine dew-distillery of the evening's sky, are brought to bear upon the production of the fields. See how the light and heat are graduated to the growth of these acres of Indian corn. See the temperature that nurses it into the blade, then into the stalk, then into the silken setting of the ear. See what purple curtains are hung around the horizon, what drying, jocund fall winds blow; what a ruddy-faced hue glows upon the ripening ears, reddening them to Indian summer tints, as they peer from the white lace drapery that enfolded them. Look at that sight, and never more let a murmur of discontent stir your lips when you talk of merchants, manufacturers, or joint stock companies, or any other occupation or profession whatever. Joint-stock companies, indeed! What company of that sort ever formed on earth can compare with the joint-stock company that carries on the smallest farm? What a firm of active partners have we here. What a diversity of capital is invested in the enterprise. What sympathy and co-working. Where falls one drop from the moistened brow of the farmer, there fall a thousand of germinating dews from heaven, and the combination touches the life of every plant and blade with a new vitality and verdure.—*Elihu Burritt.*

Book-farming.

The following extract from the *Independent* puts the case of the objectors to "book-farming" in a plain and telling manner, and we commend its logic to those who affect to condemn all agricultural writing:—

There was a farmer once who hesitated not to hurl all manner of invectives against book farming, and those who consulted books for advice. By long experience and practical observation, he had become quite successful in the culture of grapes and trees. His fields were clean and fair, and highly productive. His trees were vigorous, well adjusted, and profitable.

In conversation with a friend, he related his experience in raising grapes and trees, entering into the minutest details, sometimes becoming quite eloquent when describing his victories over the enemies which infest them.

"My knowledge," he said, "was gained by dint of application, by actual experience and hard labour. It was none of your book knowledge, written by men who know nothing about farming."

"Well," said his friend, "if all this valuable information, gained by assiduous labor and observation of so many years, and which you have so clearly described, were written out and published, which would you have a young and inexperienced man do, take this as he finds it from your pen, or go through

the same tedious process that you have gone through with, including all the vexations and losses?"

The question puzzled him, and he was silent for a moment, but was obliged to confess, after all, that there was much that was valuable in books, because combining and relating the results and experience of practical cultivators.

Do not condemn book farming. You may criticise certain books very severely, because written by ignorant theoretical writers; but there is always good wheat as well as abundant chaff. So there are many good books as well as poor ones. The time may come when a single hint from a book or paper may save your farm or orchard, or add to your wealth by telling you how to increase your crops.

UTILIZING WAR MATERIAL IN TIME OF PEACE.—The Society of Agriculture of the Drome has addressed to the Emperor a letter in which it describes the suffering state of agriculture in consequence of the continued decrease in the number of labourers, and requests his Majesty to place, in time of peace, at least one quarter of the effective strength of garrisons at the disposal of agriculturists during the summer months. Might not the hint be taken by other countries with large standing armies?

ANOTHER GUANO DEPOSIT.—An important guano deposit has been discovered on an estate called Kukers, belonging to Baron de Toil, in the neighbourhood of Jawc, in Esthonia, Russia. The bed was accidentally found by some workmen employed in draining the land, and it is supposed, by those who have studied the matter, that the layer in question was formed so long ago as in the early days before the deluge. The chief layer exposed was found at a distance of six feet below the surface of the soil, and measures two thousand feet long by ninety wide. Its volume is calculated at one hundred and eighty thousand cubic feet.

NEW USES FOR PAPER.—In recent times the use of paper in various modifications of form and manufacture has been applied, to purposes so extraordinary, that scarcely any new application of this material would surprise us. It has been used, with apparently great success and economy, as a building material for dwelling houses, to form external walls, roofs, and interior divisions. One of the latest novelties offered to the public, is a patented invention, to which the name of "felted paper" has been given, and from which are manufactured all sorts of fabrics for the purposes of upholstery or dress, such as curtains, quilts, tablecloths, and petticoats, the latter, we are told, "quite irresistible," all amazingly cheap, and the last named articles for as little as 6d. apiece. The material is also applied to articles of a more substantial character. Very good imitation leather is formed of it, capable with the addition of oil and india-rubber of making shoes impervious to wet. This new branch of industry is likely to have a sensible effect on the manufacture of and trade in woven fabrics; at all events, it will open out a fresh field for commercial enterprise.

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Markets.

Toronto Markets.

"CANADA FARMER" Office, Dec. 9th, 1869.

FLOUR AND MEAL.

The market remains dull and inactive at following rates:—
Flour, No. 1 Super, \$3 85, Oat Meal, \$4 25 to \$4 50;
Bran, by car load, \$10 per ton.

GRAIN.

There are but few transactions. The present prices here are for Wheat, Spring, 80c. to 85c., Fall, nominal; Oats, 52c.; Barley, 50c. to 57c.; Peas, nominal—65c.

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Hay, in fair supply, sells at from \$6 to \$10; Straw from \$4 to \$6.

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THE CANADA FARMER is printed and published on the 15th of every month, by the GLOBE PRINTING COMPANY, at their Printing House, 28 and 28 King Street East, Toronto, Ontario, where all communications for the paper must be addressed.

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Communications on Agricultural subjects are invited, addressed to "The Editor of the Canada Farmer," and all orders for the paper are to be sent to
GEORGE BROWN,
Managing Director.

1870 PROSPECTUS 1870

OF

THE CANADA FARMER.

THE Publishers of THE CANADA FARMER in acknowledging the gratifying support extended to that journal in its new form, during the past year, are in a position to announce that it will be sustained in the coming year with still greater efficiency. The Editorial Staff will include the following able and experienced Agricultural writers:

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The conductors of THE CANADA FARMER will continue to labour earnestly for the following ends:—

To arouse attention, by frank and temperate discussion, to all questions, scientific, commercial, legislative or otherwise, specially affecting the farming interests.

To stimulate the agriculturists of our country to adopt an improved system of husbandry, by blending the lessons of modern science with the practical experience of the Canadian farmer.

To bring under the attention of our farmers all improvements at home and abroad, worthy of adoption, affecting the management of Field Crops—the Barn Yard—the Stable—the Dairy—the Orchard—the Poultry Yard—the Apiary—the Kitchen Garden—and the Flower Garden: and to excite an interest in the progress of Rural Architecture and Landscape Gardening, and all that concerns the domestic economy of the Farm House.

To mark and report all improvements in Agricultural Machinery, foster new inventions, and promote the adoption of all labour-saving machines, in the work of the farm and garden.

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