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THE CANADA FARMER

VOL. IV. No. 6.

TORONTO,

CANADA, JUNE 15, 1872.

NEW SERIES.

The Field.

Beet Root Sugar.

INTRODUCTORY.

"Beet root sugar! Ah yes, we all know they make a great deal of it on the Continent of Europe, more particularly in France and Germany, but as no manufactory of it can be conducted except on an enormous scale, and with a heavy outlay of capital, it will not suit Canada where labor is so high, and the climate is unfitted for it."

This is the observation which the writer has had to combat in speaking of the subject with every tolerably well-informed person, while to those who knew nothing about it, the matter seemed to be enveloped in such a hopeless mystery that few could be got to approach it. After exhausting every other objection the caviller would say: "You do not understand the subject yourself; you have never made beet root sugar; book learning won't answer in a case of this kind;" and so on.

To meet these objections there was but one course, namely, to go at once into the practical manufacture of the article on a small working scale; to learn the whole business; and be able to reply to objections; my knowledge is derived not from books alone, but from practice as well. I make such an article of crude sugar that it is saleable to the refinery, in the following manner; obey my instructions and you may make it too.

As, however, it is important to carry the reader fully with me, I shall show how it was that Beet Root Sugar first came to be used, and why it has been considered a *sine qua non* that it should be made on a large scale.

Beet Root Sugar, as a national production and grand article of domestic use and manufacture, originated with the great Emperor Napoleon. His continental system, and the enormous wars attendant thereupon,

cut France off from communication with the tropic climates where the sugar of the world had at that time been produced, and thus deprived the nation of a grand necessity, as well as a grand luxury (for it is now considered by all that not only is sugar a luxury but a necessity in the broadest sense of the term), and Napoleon well understood that, although, a nation under certain circumstances will submit to be debarred from civil and political rights, yet touch the human family in any matter of daily use or daily indulgence, and they become ungovernable.

Under these circumstances he called the great chemists of France together and said, France requires sugar, the tropics are closed to us, our supply of sugar is cut off. It must be had as an article of French production and home industry; the nation requires it: the resources of the empire are at your command; but sugar must be had at any cost; make it.

The entire chemical talent of France was, therefore, turned to this point. At first they made a chemical sweet which was called sugar, but it was not sugar, and did not meet the public requirements. Then they turned their attention to the beet root, and they found that this root would yield the required substance.

But chemists as a body are governed by entirely different rules from mercantile manufacturers; chemists look chiefly to the success in their processes without counting cost; to the mercantile manufacturer everything else must bend to cost, his ultimate end is profit.

The French chemists not only had to supply sugar, but to supply it on an enormous scale, and the works were erected of a corresponding magnitude—the works were not calculated for profit but for supply—and as the manufacturers could in the first place demand their own price (as sugar, in France, could be obtained nowhere else) the works were made, in some measure, remunerative as well as to afford the public what was wanted.

After the continental war was closed, and the French were again able to enter the markets of the world, and get sugar as cheaply as any one else, the first real struggle of the beet sugar manufacturers commenced. They had to work against slave labor and against cane sugar, and also against the accumulations of stock and production and preparation for growth which had taken place while the continental markets were closed; and then for the first time it became a fair race between beet sugar and cane sugar. About that time also the beet sugar people got a great advantage over their opponents of the tropics by the abolition of slavery in the principal sugar producing countries, and it was then (with the exception of Cuba, Brazil, and the United States) free labor in the tropics with the sugar cane against free labor with the beet in Europe; and the beet sugar has ever since gallantly held its own against all opposition.

It was during this struggle that the enormous factories of beet sugar did good service to the cause; they had so much capital locked up in them that further expense to keep their position became a matter of necessity, and no cost was spared to produce efficiency, and it was then that the great improvements in the manufacture were made.

The processes were, however, kept as secret as possible, and the public was carefully indoctrinated with the idea that beet sugar could not be profitably made except in the enormous factories on the continent.

Modern science and enquiry, and the easy communication of nation with nation of the present day have gone far to open up the close corporation of the beet sugar manufacturers, and it will be seen by the following record that the mysteries so long shrouding the process, have been except a few of the full particulars at a glance.

The writer claims nothing as to the progress in the process set forth: the arrangement of the various processes is now; but more so

by the suppression of superfluities than by additions. The new part of the process is the fact that by following the instructions hereafter given, twenty-five pounds of beet root may be manufactured into a merchantable sweet, in domestic utensils as readily as two hundred and fifty tons of beet root are ordinarily reduced in one of the monster factories of the European continent.

THE MANUFACTURE OF BEET ROOT SUGAR.

The most important thing the person can do, who is to enter upon this manufacture is to forget all and every thing he has ever known about sugar making, particularly that which is made from the Maple; and he must especially bear this maxim in mind, viz:—

Beet Root Sugar is not, never has been, and, the writer believes, never can be, made into an article of domestic use, until it has been refined by a separate process.

It is an article which is made by the producer to sell to the refiner, and not to use as it is made by the first manufacturer. The crude article is quite equal in value, according to the sugar it contains, to the best brown cane sugar, commonly called muscovado, and far superior (when well made) to the lower grades of sugars, (those with a fine soft grain), which come from tropical climates.

All sugars, except maple sugar, are made at two processes—in the first the juice, whether from the sugar cane or from the beet, is defecated and boiled down to the crystallizing point; it is then set by in cisterns until the crystals have formed, when it is shovelled into barrels, and the molasses is made to drip from the sugar. The sugar is then shipped to England and America and elsewhere, and refined into loaf and into the finer kinds of soft sugar in the great Refineries.

In France and Germany all the great manufacturers produce the sugar first as crude sugar, and then refine it; they are now, however, in many instances working the branches separately.

Cane sugar, even when made at the best season, in the best manner, and from the most favourable growth of cane, contains a large proportion of molasses and uncrystallizable sugar which will not, and does not in its native state, crystallize. The after processes of the refiner, however, finally extract all that portion which will crystallize from that which will not, and the latter is disposed of as treacle, or as the various grades of golden and other syrup.

It is quite true that a considerable portion of the sugar from the sugar cane is used as a domestic sweet in the shape of brown sugar, but even this has been partially refined; but by far the greatest quantity of sugar used is refined in the great English and American Refineries before it reaches the public.

Canadian ideas of the manufacture of sugar are formed from the maple sugar made on the

farm. This is the purest source of sugar which the vegetable kingdom supplies. It has deposited all its woody portions and impurities in the tree, the growth of which it nourishes, and we get it filtered and purified to the greatest possible extent.

Beet sugar must not be looked at for a moment with the same ideas or treated in the same manner.

The beet root contains besides sugar and woody matter, portions of albumen, pectine, and other substances, and also a flavouring matter of a strong beety odour, but chiefly large quantities of potash and salt.

Were it not for the potash and salt, and the strong beety flavour before spoken of, the juice of the beet when defecated would boil down into a pure crystallizable sugar, at once usable as maple sugar is.

It is the beety flavour and the potash and salt which we have difficulty in getting rid of.—Those matters, however, yield at once to the operations of the refiner. The only portions of the extract from the beet root which in the refiner's hands are not made use of is the essential oil which causes the strong flavour, and any other impurities which ought to have been removed before it comes to his hands. The mixture of potash and salt when extracted from the syrup and purified is really worth weight for weight, at least as much as the sugar.

Where people wish to engage in the manufacture of alcohol from the beet root, they can do so to a great profit, as beet root yields to the distiller far more spirit per acre than the best crop of either grain or corn does. The apparatus for distillation is quite simple and comparatively inexpensive.

The following table will show the money value obtained from the entire beet root crop in France alone, in the year 1865-6, and it must be remembered that Germany, Belgium, Holland, Austria, and Russia, all make their own sugar, or at all events the greater portion of it, from the beet root, and in all cases it must also be remembered that the beet root industry is one that has been, and is, constantly increasing.

The beet harvest of 1865-6 in France alone produced

275,000 Tons of raw sugar worth	£6,250,000.
100,000 Pipes of strong spirit—	
each pipe containing	
from 100 to 120 gallons,	
part distilled from the	
root direct, without the	
assistance of the sugar	
manufacturer, and partly	
from the molasses,	
and worth	1,350,000.
20,000 Tons of potash, worth	500,000.
1,600,000 Tons of pulp, worth	1,000,000.
	£9,100,000.

This is what is produced from the entire beet crop—not the value of the produce of the sugar manufactory.

The imports of beet root sugar at the British and Scotch ports for the first eleven

months of 1871 were 134,490 tons, against 56,670 tons for the same period in 1870, and 31,060 for the same period in 1869; this shows the enormous increase of the manufacture.

Now, it is perfectly ridiculous to suppose (in the face of such a statement as the foregoing) that Canadians and the inhabitants of America generally, are going to confess inferiority to the French and Germans, and to allow it to be said, we have not nationally sufficient intelligence to make sugar from beets, when the continental nations are able to assist in supplying the world with that necessity.

Some people have been rash enough to say that our climate and soil are not fitted to produce the root rich enough in sugar to pay. This we most emphatically deny. The extended trials of the American patent office, and the numerous instances of Canadian grown beets which have during the last two years come under the writer's hands, all show beyond question that Canadian beets, where well selected and well grown, are as rich in sugar as the best French and German or continental beets. If any one doubts it, all he has to do is to grow a patch of the best kinds of sugar beet in his field or garden, and following the instructions hereafter given reduce the roots to such a state that the amount of refined sugar they contain is easily proved by the ordinary tables and instruments. Others will say, and they are far the most practical, If it can be done, why has it not been done? In reply, I affirm that it is only because the manufacture has been made a mystery of and has not been understood. The chief trouble of the manufacture has consisted in the uncrystallizable sugar, and this, it is now proved beyond a doubt, has been caused not by the sugar contained in the well grown root being inferior, but by the process adopted being imperfect. If the following instructions are carefully carried out, all difficulties and troubles as to uncrystallizable sugar will cease to be a serious obstacle.

With these few observations, I propose to lay before the readers of this little treatise, full instructions for the growth of the sugar beet and its conversion into such a class of crude sugar as is best fitted for the refiner, and in every way equal for the purposes of refining to the best tropical sugar that is produced.

SUMMARY OF THE PROCESS.

I shall first describe in very few words what is necessary to do, and then more at length the best way to do it.

The roots are washed with great care after being stripped of the leaves, and the crown being cut off, taking care not to break off the small lower end of the roots, which are richest in sugar.

The roots are then rasped down into the finest possible pulp.

The pulp is then pressed so as to get out the juice in the most perfect manner, and clear from all particles of root.

The juice is then put in the boiler and brought to a boiling heat.

As soon as the juice boils, you add to it milk of lime, carefully made from fresh burned lime-stone. The way to make milk of lime will be described further on.

The addition of the milk of lime checks the boiling and you will see the juice turn from its black disagreeable color to a light shade, at the same time it breaks into flocks, a kind of curdling taking place. You stir the juice just enough to mix the milk of lime all through it, but not enough to break up the flocks or curdlings.

As soon as you see that the juice clears between the flocks (which will be in the course of a minute or two), the whole contents of the boiler are, as rapidly as possible, cast on to a filter cloth of canvas; as fast as it strains through the canvas it must be pumped back on it until the juice runs through the canvas bright and clear as wine. It should be of the color of pale cherry.

When you find it run clear let it go into a shallow vessel, and cool as quickly as possible.

When the liquor has cooled down to 120° Fahrenheit, set the carbonation bellows (hereafter described) to work, and continue to pump or blow the carbonic acid fumes from charcoal, or hard anthracite coal through the liquor. This gas destroys the causticity of the lime, and makes it into a carbonate, and it then falls down in the liquor like a fine mud.

You continue to blow the gas from the carbonation bellows through the liquor until all caustic in the lime is destroyed. This is known by the thick mud settling rapidly out of the liquor, leaving it clear and fine.

Then take some of the clearest in a glass, or, if you can do so, filter a little through a close cloth, until it is fine, then blow with a pipe or straw your breath from the lungs through the liquor. If your breath muddies the liquor, the bellows have not worked long enough. If your breath does not muddy the liquor, the carbonation is complete.

Then filter the whole through canvas until it is quite bright and as fine as wine, returning the first runnings until it runs clear. It will be quite bright, and may be a little darker than it was before it was carbonated.

It is now fit to evaporate down into syrup; and as soon as it reaches the proper density, or proof, it is set by in a warm place, and in the course of eight or ten days the whole mass will crystallize into coarse dark crude sugary substance, and this then, as soon as it is parted from what little molasses it contains, is fit for the refiner.

Had the syrup been evaporated in a vacuum pan (as it ought to be when the operator can afford it), the crystals of sugar instead of being brown will be nearly white, and only require the cleansing action of jets of steam in the turbines, will be described further on.

As soon as the crude sugar is all crystallized, throw the mass into the turbine, which is then made to revolve rapidly, and the molasses are thrown off through the wire gauge, or perforated sides, of which the turbine is composed.

The resulting sugar, although not fit for domestic use, is then fit for the refiner, and is at once a saleable article.

The molasses are set by to crystallize again, after having been exposed to the osmose process, which is described further on. Where the crystallization is very complete, it may be a question whether it is not better worth while to feed the molasses to the pigs and cattle than to purify it; but it must be fed in very small quantities. By doing so the farmer gets the full benefit of all the salt and potash in his manure, which it is a most important thing to do. In small quantities it is very wholesome and fattening to the cattle.

The only drawback to growing beets on a farm for sugar making, and that is more a theoretical loss than a practical one, is the loss of the potash and salts which go off in the molasses; but they are retained by being fed to the cattle and hogs; and if this course is pursued, the beet farm would in a very short time attain such a pitch of fertility as to render exhaustive crops now and then an absolute necessity.

With these plain instructions before them those who cannot make a crude merchantable article of beet root sugar are certainly not fit to conduct any business or farming operations on anything but the most limited and consequently unprofitable scale.

Where, instead of making sugar from the beets, spirit is distilled and the slop or refuse and the pressed cake from the roots are used on the farm, beets may be grown in the same land year after year with an annually increasing productiveness. This has lately been proved in England (and long since was proved in France and Germany). In England beets which are used for distilling have been grown on the same land for seven years following with the best effect, the manure from the former crop being used, and the crop in the later years more than doubled; while from the continuance of hoed crops the weeds have been all but exterminated. What a prospect this holds out for our Canadian thistle infested lands.

The same effects would follow in making sugar from the beet provided the molasses were fed to the stock.

In all the departments in France and in Germany where beet sugar is grown and manufactured, the yield of wheat produced in those departments has been more than doubled, and that notwithstanding that potash and soda is made from the refuse of the sugar and sold and taken away from the land, thus really depriving the land of important mineral constituents—so fertilizing to the farms is found the feeding of the beet

root pulp and the increase of manure from the numbers of cattle kept on it, in spite of the loss of potash and salts in the sugar crop.

We will now go more closely into particulars and begin with the—

CULTIVATION OF THE ROOTS.

The proper cultivation of the roots is one of the great requisites to ensure success in the manufacture of beet sugar. The culture and planting, should be such as to ensure roots of small size, not exceeding 3 to 4 lbs. each, and often under this standard. The crop will be equally or more productive in sugar, if the major part of the roots are grown so thick, in the row, as to ensure their small size. The after management, must also cause the root to be almost or altogether under the earth; as, if otherwise grown, that part exposed to the light, will not yield a full supply of sugar; and it has been the received opinion of many analysts that glucose instead of crystallizable sugar is thus formed. The seed should be sown in drills about 18 inches from centre to centre, and the roots may stand at 6 inches apart in the row. Of course they will be thicker at first, but may be thinned to that distance. The land should, and must be pulverized and prepared so that when burying the seed there may be about one and half inches of fine mould to fill in over it. At all events the depth of the seed must not exceed two inches, when covered in; and above all things a moist time should not be neglected to complete the sowing. The seed to be sown may be either the Vil-morin or white Silesian; both are good, but ordinary unnamed sugar beet must be avoided, as it too often is only white mangold wurtzel. The preparation of the soil is most important; in fact, it is imperative that to ensure ease of culture and certainty of crop, one course should be pursued. As to soil, any quality of good dryland will answer well, and any previous crop will not materially affect the following beet yield. But it is absolutely requisite that the following course be followed. We will suppose the land that is to be sown with beets, has been summer fallowed—If this course is pursued it will amply repay the time lost, and expense incurred by doing so: but fallowing although advisable, is not absolutely necessary. About the beginning or end of September haul out the manure—any kind will do, but some is very desirable—spread a thin coating over the field, then ridge and furrow the land, throwing one furrow each way; exactly the same as if you were hilling up potatoes. The manure will then all be directly under the ridges, so formed. Nothing more need now be done to the land before the middle of April, by that time the seeds commence to sprout, and tiny small, plants can be seen. You must now construct a harrow, or succession of very small light double harrows, so small that each will take a ridge, there must be a joint in the centre to allow each wheel to travel on one side of each row. All the weeds will be killed by this harrow and the

rows will not be lowered more than one half the original height. Once each week the land must be harrowed until the middle of May—when all the weed seeds within the influence of the air will have germinated, and the land be absolutely clean. Now sow the seed, and two weeks or less will see all the plants up in rows, and no weeds to injure the growth. There you see you have expended very little labour on the land, only once ploughing, and this is all to be done in the fall, your land is clean, and free from weeds; the beets will then get the start of any that may subsequently grow. Directly you can do so with safety to the young plants, run the horse scuffler between each row. This implement must be so constructed as not to do too much. The weeds will be small and easily destroyed. A slight hoeing in the row may be necessary, but if the land was fallowed the year previously, there will hardly be any occasion for it. But if the land be not fallowed, the same system must be pursued. The same fall manuring, the same ridging up, and the same harrowing in the spring. Whereas if an opposite course is followed, and the work all done in the spring, the weeds will have a fair even race with the beets. The land will have laid dead and wet all winter without any early spring drying and exposure to the air by the furrowing system. And in many cases there will be a fortnight's difference in the time at which the seeds can be sown. It will readily be seen, that all the manure will be under the ridge, and nearly double quantity of surface soil will be in the ridge, and there will be so much more depth of earth for the plant to penetrate, instead of being forced out of it, there being no doubt that every pound of root grown at the bottom, deeply buried in the earth is worth one and a half pounds of that portion exposed to the air and light. Hence the necessity for earthing up; and this must be done occasionally with a doublemould-board plough, so set or constructed that a little fine earth can be raised from between the rows and deposited nicely on each side of the plant, leaving however, a small ridge out of which the green may grow. The rains will wash these small ridges down somewhat. When in England some years since, the writer used such a plough for a number of seasons with excellent effect.

About the last of September the roots will be ripened sufficiently to commence grinding and pressing, and we now come to the most troublesome part of the process so far as cultivation of the root is concerned. Hitherto every thing has depended, (so far as trouble of manipulation is concerned), on suppressing the growth of weeds until the beet plant shall have sufficient power to overgrow them, and if the foregoing directions are carefully followed there will be but little trouble or expense. The preparation, manuring the land in the fall cannot be too strongly enforced. By so doing you have the manure all well decayed just when the plant requires it; you

have a double depth of earth for its growth over the ordinary level field; you have the land dry and wholesome for spring harrowing; you have above all things the start of the weeds, and ever afterwards during that year the beets will be ahead in the race instead of being at times overrun and half smothered, and during the summer you have a depression into which all weeds will naturally be swept by the action of hoeing, which thereby escape all chance of re-rooting after rain, in the row, and you have an easy mode of cultivating during the summer with a properly constructed scuffler, between the rows as occasion requires.

WASHING THE ROOTS.

The roots before being submitted to the rasp, must be thoroughly washed in a rolling cage, great pains must be taken that no dirt shall be allowed to remain on the roots when they come to the rasp, and the heads of the roots and leaf stems must be carefully cut off; and if cattle are kept to consume the portions of the root which come from the press, so that waste would not occur, the whole head of the root ought to be cut off, and fed to the cattle. It has been proved time and again that the extremity of the root end of the plant is the richest in sugar, whilst the portion which is grown above the ground is the part which contains the largest proportion of potash and salt, hence in the continental countries of Europe where the government excise duty is charged on the roots consumed, the entire portion of the root which grows above the ground is cut off and rejected for sugar purposes. Any plan which will insure perfect cleanliness in the roots, is that best adapted to the work, and the roots should be allowed to drain off all superfluous water, before they come to the rasp.

THE RASPING THE ROOTS.

The roots should be presented to the rasp endwise, and the rasp (however constructed) should reduce the root to the finest possible pulp. The pulp, should then be passed through rollers working together, which are of sufficient surface to receive and crush, the pulp as it comes from the rasp. The rollers will thus reduce the pulp to a perfectly smooth paste, and burst all the cells of which the root is formed, and which cells contain the sugar.

There are many ways of making the rasp. That is the best which works with the greatest speed, and reduces the root to the smoothest and most complete pulp.

PRESSING THE PULP.

The following is the old fashioned plan. There have been, and will be many improvements. The pulp must be placed by small parcels at a time, (according to the size and power of the press), on strong canvas cloths, each cloth being laid over a frame about 2 inches deep, and the size that will go into the press; the cloths must be much larger than the frames. When the frame is full, fold over the cloth first from side to side,

then the ends over; then place the cushion of pulp so formed in the press; there must be a strong board larger than the cushion of pulp, and it must rest on one board while another covers it; one board going one way of the grain, the next above crossing it, and so on, parcels of pulp and boards until you have the press full. Then put on the power gradually, so that the juice can escape readily from the cloths, without bursting them; press to the full power of the screw, and take care to catch all the juice.

The juice should run from the press at once into the kettles, where the heat should be raised as quickly as possible to 160° Fahrenheit's thermometer, and it should not fall below this heat, so long as the kettle is filling.

When all the juice is out that you can get out at the first operation, with the press; take the cakes of pulp, put them in hot water, and let them soak for an hour. The water must be nearly boiling, as the cakes will cool it sufficiently. When broken up and mixed with the hot water which they should be at once, the heat ought to be between 150° and 155° (Far.); and if not so, add more hot water until that heat is attained; then cover up, and keep it all hot. This is necessary to prevent fermentation or acetification. Then proceed to press the mashed roots again, in the same manner as at first.

It is scarcely worth while to squeeze the pulp more than twice, although it ordinarily takes three pressings to get out all the sugar. If your press is sufficiently powerful you can get out all the juice at once.

Strain the juice through a fine strainer, and get the juice into the kettles as soon as possible. Neither the first juice nor the second must ever be allowed to fall in heat, below 150°, or souring may commence. when in the kettles, heat the juice as quickly as possible, to just boiling; then add the lime in the following manner; the juice will be very black, and dirty looking, but it will all come right with the lime.

TO MAKE THE MILK OF LIME.

Get some good, new, hot lime, slack it in boiling water; stir it up and let it settle for a minute or two, and pour the liquor off the dregs; you must leave all the coarse part of the lime behind, only take off the milk of lime, which must be quite smooth and without grit.

This should be made and put in a barrel; the lime must be caustic and strong; when kept under water it will keep for any reasonable time in a caustic state. When the juice boils, add some of the milk of lime to it, and stir it slowly. When you find the juice change colour, and curdle, shewing clear in spots, and when it shows signs of settling, you have put lime enough; stir the juice gently until the lime is mixed well through it, but don't urge the juice to a rapid boil; then take out a sample in a glass and see if it clears, and is the colour of white wine if so enough lime has been put;

if not, put a *little* more, but don't put more lime than enough. As soon as the juice flakes, or curdles, it is done. It need not be more than five minutes, from the time you put the lime, until you filter the juice.

Now empty the juice as quickly as possible, out into a canvas strainer, formed by stretching a canvas cloth so that it hangs down in the middle; it should spread as wide as possible, so as to give the greatest amount of filtering surface. As long as the juice runs thick, you must pump back again on the filter, taking care that it shall enter the juice in the filter, with as little disturbance as possible. When the juice runs clear, let it drain through the filter cloth without further disturbance. It should be as clear and bright as any wine; it is then right.

Let the strained juice get cold, and it will then be ready for carbonatation.

Although the juice is now so fine and clear, yet there is a great deal of lime in it, though you cannot see it, and this lime is caustic. This causticity must be destroyed and the lime turned into its original chalk or lime stone, though in a state of fine mud; and this is called carbonatation.

CARBONATATION.

To effect this operation, you must get a pair of blacksmith's bellows, or any other good blowing machine, and have a pipe fixed to the nozzle which is to go down into the juice; the pipe should be long enough to curl round the bottom of the vessel which contains the juice, and it must be pierced full of small holes, so that when the bellows are worked, the air they contain will be forced in numerous small streams, through the liquor. But the air alone will not carbonate the lime; so you must make the following arrangement. Get a number of lengths of common stove pipe, to a length of from ten to fifteen feet, at one end is fixed a charcoal stove, with the means of closing the top, so as to enable you to draw the air as much as possible through the charcoal fire, fill the stove and light it; as soon as the coal burns clear from smoke, it will be ready to use. The object of the length of the stove pipe, is to disperse and let the heat pass off, so that you may not burn the bellows. The end of the pipe away from the stove must be fixed by a flexible tube to the hole in the bellows, which is intended to draw in the air, then by working the bellows the air will be drawn through the charcoal fire, and be turned into carbonic acid gas; this gas is then forced into the juice, which it carbonates. You can use either charcoal, or anthracite coal, as the latter affords carbonic acid gas as well as the former, and is better in some respects where it can be had, for the dust and ashes of the anthracite does not contain potash, or other salts that would be mischievous to the syrup, and any dust that gets in can readily be strained out.

The syrup should be cold if you have any means of keeping down the froth, which will

be raised by means of the bubbling of the gas through it from the bellows; but if you have no such means, just warm enough to keep a *little* grease, such as lather, melted on the surface of the juice; the syrup or juice won't froth with the grease, but the grease does not improve the sugar.

You must keep the bellows driving the gas from the burning charcoal, or anthracite, until you see that the chalk or lime is all set free, and settles well, then take some of the fine clear liquor which has been carbonated, and put it in a glass, and blow through it with a reed or straw, from your breath for five minutes. If it gets thick, you have not carbonated it enough. As soon as you are satisfied that it has been thoroughly carbonated, strain it through a filter cloth, in the same manner as at first; but the cloth must first be well washed and perfectly clean, and the syrup or juice will then be fit to boil down into sugar. If you don't do it right the first time you must try it again, but the lime must be all out of it before you evaporate it down for sugar.

You may then boil the juice down to a proper consistency, and if all has been well done it will crystallize into brown crude sugar in about eight days; but the syrup during this time must be kept about as warm as fresh cow milk. During the process of evaporation, the syrup should be strained through a filter bag several times.

When ready to set by to crystallize, the syrup must be so thick that when a drop is parted between the finger and thumb, it ought to break across the thread, and the ends turn a little; it must be perfectly bright and clear though the colour may be dark. It had better however, be a little too thin than too thick, as the thin syrup will get thicker whilst set by to crystallize, and it is believed that in that shape, it makes larger crystals.

Now, the difficulty with beet sugar has always been the crystallization, and the trouble has been what the Germans and French call "slime sugar;" but if the foregoing rules are *exactly* followed, there will be no slime sugar, or treacle—sincerely enough to enable you to get off that portion of the syrup which contains the salts, and which must be got out from the mass with the turbine. If you proceed to the second, operation bear these few rules constantly in mind. In the first operation when you add the milk of lime to the juice to clear it:—

1st. Never keep the lime in contact with the hot juice *or* *any* longer than you can help it; the lime cannot be dispensed with to clear the juice, but its action on the hot juice produces more or less of slime sugar.

2nd. Do not agitate the juice with the lime in it, more than enough to mix, or you will spoil your filtration; the larger the flakes remain in the juice the better it will filter.

3rd. Never carbonate at any other than a low cow milk heat. If you carbonate hot, as most of the books tell you, you will make slime sugar.

Of course throughout all the process of boiling, heating, and evaporation, you must be extremely careful neither to burn, nor even brown the syrup. The syrup will always be highly coloured; but if it has not been burned, all the colour comes out without waste in the after processes, and if the process of evaporation is conducted in the best manner, the sugar which crystallizes out of the coloured syrup, will be nearly if not quite white. The burned sugar can never be recovered.

The above is as far as the writer would recommend any farmer, or any but a sugar refiner to carry the process. If the foregoing instructions are well carried out, the thick syrup produced is just in the proper state for the refiner,—and it will always command a reasonably good and remunerative price.

The foregoing instructions are the result of actual experiment, and may be relied on as the result and experience of two years' continual experiments on a working scale.

REFINING.

The foregoing is as far as in the writer's opinion any farmer or small manufacturer ought to go in the preparation of an article for the manufacture of beet root sugar. There is nothing in the foregoing processes which a person of ordinary intelligence and information cannot do. The process is a simple one, and the result, an article of a certain commercial value.

Refiners of sugar want to get their crude materials with as little done to them by people who do not understand refining as possible; as they have certain processes to go through, and they do not of course want to have to amend the blunders of other persons; and any attempt at partial refining, or the use of chemicals by the producer, is quite as likely to be wrong as right, for the after processes; but as every one wants to know something more about the method of refining the crude material before described, and as many persons are adapted to follow out such after processes with success, I shall now proceed to describe in general terms the process of sugar refining, with this caution, that I only go into the matter generally, and that no one should go into much of an outlay in the refinery process, until he has by experiment made himself thoroughly master of the subject. It is one that admits of experiment; and success, (so far as the result of refining) can be attained on the small as well as on the large scale; that is, any man after studying the subject can refine one pound, or ten pounds of the before described crude material, into pure sugar; but he will not be able to make use of the refuse, nor to do things in the economical manner in which they are done in the large refineries, he must not expect to be able to conduct the business on a profitable scale. Nevertheless it may suit a number of persons who may prefer to manufacture at home, at no profit, rather than

purchase, even if they do so at what to the manufacturer would be a positive loss. I shall proceed to give such instructions as will enable those wishing to do so, to carry out the process of preparing beet root sugar, and converting the crude article into such a sweet as will be consumable in a family.

The decolorizing of the syrup and the destruction of the strong beet flavor, before spoken of, are accomplished entirely by the use of animal charcoal, which consists of burnt bone, prepared in a particular manner, and brought to such a state that the syrup will only percolate through the vessel which contains the bone charcoal at a slow rate. The bone charcoal is put in tall narrow vessels made of copper or boiler plate, often in some of the larger refineries as much as from 20 to 30 feet high, and of a breadth of from three to four feet. In other refineries the dimensions are different. In the beet sugar factories in France and Germany, the size of the bone black filters is generally 12 to 15 feet high, and a diameter of about 40 inches. There are several of these in a factory, and they are each so arranged that juice, syrup, hot water, cold water, and steam can be severally applied as wanted. There are tight covers held in their places with screws, to fill and to empty the filters, and also means of applying chemical substances and gases to the bone black as it becomes saturated with impurities, and requires to be cleansed.

After these filters have been worked but comparatively a short time, they lose their power of destroying the color and peculiar flavors of the syrup or juice. The filters have then to be emptied, and the bone black heated to a dull red in closed iron vessels, so as to burn out the impurities which have destroyed its peculiar powers. The bone black is then quenched and cooled out of contact with the air in properly prepared machines, and the filters are again refilled—to be again emptied, and the coal returned as soon as it becomes exhausted.

The burning of bone charcoal and also the revivification of the bone black when it has been used, are very offensive operations; so much so, that they are not allowed to be carried on in the City of London, which was the great centre of sugar refining; and the cost of burning and reburning,—carting, into, and out of, the City of London, has been so great, as to seriously injure the trade, which has been principally removed to Glasgow, where the civic authorities are less sensitive to smells, and more sensitive to commercial prosperity.

It is this bone charcoal business, that will always prevent the refining to any great extent of beet root sugar by the farmer and small manufacturer: the amount of capital invested in the bone black, and the necessary machinery, and utensils are enormous, and the business must be continuous, and extend all the year round.

Another reason why the refining of sugar cannot be profitably carried on by any

person largely in the business, and whose works are carried on continuously, is the expensive and complete nature of the evaporating vessels which are necessary, and which are called vacuum pans. These are machines in which, owing to all the air being extracted, and the syrup boiled by the heat of steam "in vacuo," the watery particles are evaporated from the sugary substance at so low a heat, that not only is the operation carried on with great rapidity, but at so low a temperature that burning or browning the liquid is impossible; and consequently the sugar is produced from the vacuum pans in a colorless state, and on crystallizing becomes white sugar. All white sugar is thus made.

But these pans are very expensive machines, and require great steam power, and skill to work them; and although doubtless substitutes of a much more simple form, and at less cost, will eventually be produced, yet at present this class of machinery is entirely beyond any person who is not a capitalist, and may therefore be banished from the minds of the farmer and small manufacturer, but that will not prevent the farmer and small manufacturer from producing the crude sugar before described, and which when well and carefully made, will be in the very best possible state for the use of the great refiner.

With these observations I will now proceed to describe, how the amateur can decolorize the beet juice and syrup so that it shall crystallize into a form of light brown sugar. It cannot be white without vacuum pans. First, as soon as you have the beet juice boiled down to a tolerably thick syrup, you must (in order to obtain the best results), submit the syrup to the "osmose" process, which is done by exposing the syrup in a thin stratum on sheets of parchment or parchment paper (the latter is very cheap) while on the other side of the paper water is applied, so that the water touches every part of the parchment paper. The salt which are contained in the syrup, owing to their being possessed of a greater power of what the chemists call "diffusibility," pass through the parchment paper into the water, while some of the water passes back into the syrup and thins it somewhat: a little sugar passes with the salts, but in very small quantities; the main body of the syrup remains behind on the parchment paper in a greatly purified state, and is in great measure deprived of the potash and salt which it contained. When the process has been continued for as long a time as you may consider necessary, (I have kept it in this position from half an hour to a whole day) you remove the syrup and proceed to evaporate it further, until it gets thick enough to crystallize into sugar: let it remain until the crystals are well formed; then pour it out on a fine sieve, or put it into a turban and let the molasses drip from it; then the molasses (which contain nearly all the remains of the salts,) may again be submitted to the osmose process, and the syrup be again crystallized.

The resulting sugar, when you have enough of it together, should then be redissolved, and reboiled, adding to the liquor before it boils, some bullock's, or pig's blood, or white of eggs, and a small quantity of finely powdered bone black; the blood or eggs and bone black will cause nearly all the remaining impurities in the sugar to rise in a scum to the surface: as soon as the liquor boils, this must then be removed, and the syrup be well strained, and again evaporated and crystalized, and the result will be a brown sugar of tolerable purity.

In order to show how much potash and salt you take out by the osmose process, evaporate the water after it has been exposed to the osmose operation, and finally burn the residue at a red heat in an iron pan, this burns up all the sugar and other organized substances, which have mixed with the salts; then dissolve the ashes of the salts, by washing the iron pan which has been heated red hot, and filter the resulting liquor through blotting or filtering paper; the liquor will come through the filtering paper quite bright and clear, and colorless, but so strongly alkaline that you cannot mistake the potash and salt, or doubt the large quantity which has been removed from the syrup.

What has thus far been written will show any thinking person that the thing to be done for the benefit of the farmer and small manufacturer of Canada, is to manufacture the crude article ready for the use of the refiner and not to interfere in any way with that most expensive and difficult branch of the business.

Full practical information, accompanied by proofs and experiments on a working scale (made in the presence of parties who require it), and also analyses of beet root, so far as the quantity of sugar it contains, will be furnished on application by letter post paid to John A. Cull, Esq., P. O., Toronto.

VACUUM

Carrots and Mange's.

Some little discretion should be used in the planting of roots suitable to Live Stock. We had hoped that farmers were all perfectly convinced, that animals can neither be well nor profitably carried through our long winters without an abundant supply of such succulent food as is contained in what are usually named field roots. We find, however, that there are actually fossils who will not believe in roots, or think that their cultivation is too costly.

Not only do roots contain elements of food highly nutritious, and particularly healthy, because laxative, but a root crop is the only true preparation for a successful barley crop, and especially for a certainty of a good catch for grass seeds. After a field of well cultivated roots we never remember a complete failure of grass seed—mind, we say, well cultivated.

Now, first in the matter of selecting root ground—those of our readers who follow a

regular rotation in crops could have named their root field for 1872 years ago, but the sight that has greeted our eyes for the last four years upon a farm not many miles from where we write has forced us unwillingly to believe that a word of advice is yet most essential in this matter to many farmers in Canada. On the farm which we have above mentioned there is a small field alongside the barn, upon that plot to our certain knowledge has all the manure of the barn yard (not very much either) been ploughed under, and why? Because forsooth it is handy to the yard. How on earth the farmer can raise anything but rotten potatoes and turnip tops, we are at a loss to see. However, as he always ploughs his manure about 8 inches down—not because he believes in deep ploughing, not he, but the land is so loose he cannot help himself—it is altogether probable that the majority of the manure contained in his manure goes to enrich a gravelly sub soil. Happy state of land to the scientific inquirer who shall rip up with steam. We do not suppose that there is another old upon this identical farm that would yield over 10 bushels of wheat to the acre, under the happiest conditions of seed and season. We do not approve of what we may call everlasting summer fallow. Without overlooking the fact that land will become so foul or so compact as to necessitate the intervention of a summer fallow, we think that much may be done to abolish this system by increasing our acreage of roots and putting such hoed crops not in the cleanest or hardest field on the farm, but upon the dirtiest. But ah! says the economist of labor, it is such an awful job to work in a dirty root ground. The reason of this is that the ante cultivation for roots is put off too long. Generally the land is not touched until planting time has arrived, and then the land is worked, the weed seeds freshened up and allowed an even start in struggles for supremacy with the cultivator's crop.

An anomaly it may seem, but a dirty field is practically always a poor field. For even should the land be full of plant food, yet there is none for the cultivated, all is for the wild growth.

We do not usually plant before the end of May at the earliest. There is ample time for the fallowing of the root ground between the opening of the spring and the planting season and in that time by early ploughing, dragging and thorough and constant working the seeds of weeds may be nearly all sprouted and destroyed.

It may be urged that the season we have mentioned is fully taken up by the hurried work of spring sowing. As however the root ground is usually but a tithe of the cultivatable farm, it is indeed strange if odd times cannot be snatched for such a very advantageous task as that of preparing for a full root crop and the saving of many an after day's hand fight with noxious weeds.

Of all roots, undoubtedly the best is the

best for fattening purposes, but we do not consider any root so generally advantageous to the store cattle as swedes. The latter have many other advantages, they can and should be planted at a season when the busy time of spring seeding is over, and it takes very heavy frosts to injure them at harvest.

Without further entering into the peculiar value of the many and various roots, our space will only permit us to speak of the three kinds, without either or all of which no farmer should feel content.

CARROTS, MANGOLDS AND SWEDIS.

To the Flemish we are undoubtedly indebted for the first introduction of carrots, and today in Canada the most suitable kind for a farmer's general use is the white large Belgium. The carrot revels in a loose sandy loam and from the very nature of its long tap root requires a deep seed bed.

We have an objection to the immediate use of manure to the carrot field as we have always observed that the carrot when it comes into contact with fresh manure invariably divides and throws out prongs, and where so deformed, it causes much extra labor both in harvesting and storing. We should advise the application of manure in the previous fall, so as to secure its thorough incorporation with the soil. If however spring manuring has become necessary, long dung should be carefully avoided, if the farmer would wish to grow a long single rooted carrot.

Arthur Young, says: "If you would command your crops of this root, you should manure the land with 25 or 30 loads of dung per acre, rotten, ploughed in." Although his amount is very heavy and beyond the reach of the ordinary farmers, yet he lays much stress on the necessity of the manure being rotten.

The carrot seed is extremely light and from its feathery nature, clings so closely together as to make it hard to sow with any kind of drill. It is an excellent plan to mix it with very fine sand. The seed also germinates very slowly, and the weeds are apt to get so much the start as to hide the plant when it first comes through. In order to facilitate the sprouting it is very usual to soak the seed before planting; this is done usually in a bag with warm water for about 48 hours when it is laid out to dry. It is also a good plan to lay the seed in small heaps in a warm place but out of the sun. Wet them with the draining from the stable, and turn over daily. This may be done for 8 or 10 days and the plants will appear very quickly after sowing.

The quantity of seed varies. Four pounds to the acre is about the usual amount, but should there be reason to doubt the goodness of the seed, from five to six pounds will not be found too much. As to the time of sowing. Carrots can hardly be got in too early. The sooner they are sown the larger and better in quality will the crop be.

The carrot is an almost indispensable food

for horses. They keep the animal's bowels in a laxative state, are fattening, tend to keep the skin bright and the coat shining, and not only are eagerly eaten by horses in sound health, but are seldom refused by one that is off his feed.

Culture.—The best early culture is that of Fall ploughing; and in this operation depth must be duly considered. No depth can be too great if the subsoil be exposed to the action of a winter's frost and barn-yard manure be laid on. If it be not found practicable to plough 15 or 20 inches, let a subsoil plough follow and thus pulverize thoroughly beneath the furrow.

Many times have we been asked why large crops of carrots such as are common in the old country cannot be raised in Canada; the answer is simply that they have not room. A very great number of turnip crops are comparative failures simply owing to insufficient room being allowed to the individual turnips to grow, and it is also so with carrots, the only difference being that the latter require the expanding room below.

When the carrot has shown for about ten days, they should be carefully thinned out at least nine inches apart. The carrot then requires no more cultivation than is entailed in the constant passage of the horse hoe between them—the rows may be any distance from 20 to 30 inches apart; we prefer two feet, as it gives us a better chance to work between them with a horse.

The best soil for *Mangel Wurtzell* is one that is moist but not wet.

The cultivation of this root is so similar to that of the Swede that we shall defer its consideration until we take up the subject of turnip culture.

It differs from the turnip in that it requires more careful thinning, as two or three springing from one seed require to be separated by hand.

It is very susceptible of injury by frost and therefore must be secured early in the Fall.

It is an excellent keeper and forms a necessary substitute for turnips to milch cows in late winter, when the latter become bitter and stringy and impart a strong and unpleasant flavor to butter.

On Turnip Culture.

The time for Turnip sowing is at hand, and we would therefore lay before our readers a few of those principles which must be closely regarded in order to secure a successful crop of this most indispensable cattle food.

Among the great errors too often made, is that of neglecting any preparation of the land previous to the immediate fitting for the seed. A little time and work spent in what we may call ante-cultivation, is of more value than very much more when actually preparing for the reception of seed. A farmer often has laid out a very foul field for roots, and he is right often in so doing, for the cultivation

of roots may also be made a cleaning of foul land. Turnips must have clean land when they are actually growing.

All land, let it appear ever so clean, has many weed seeds, and manure often brings in shoals.

There is plenty of time between the end of seeding time and the beginning of planting, to partially summer-fallow the root ground. It is generally very warm and dry in the latter part of May, and a few days constant stirring of the root ground with cultivator and harrow, brings to the surface and destroys an immense amount of weeds.

Our own plan is, if possible, about the 10th of May, to plough our turnip ground, which has usually been already once ploughed in the previous fall. We then immediately cultivate it, and harrow thoroughly, we let it lie and as soon as rain has caused many of the worst weeds lying on the surface to take root again, and many more young weeds to shoot up, we cultivate again. In fact, we use every opportunity that can be snatched, to thoroughly cultivate and annihilate the weeds, previous to the planting of our turnip seed. It is far easier to destroy weeds with two-horse implements, the cultivator and the harrows, than with the horse hoe, and how much more easier than by actual manual labour.

It has been said that so much labour upon the turnip crop will not pay. If we look at a turnip crop, and calculate its worth in dollars and cents, to be made in the market, or in the shape of beef, we do not believe that it can be called a paying crop; but as a crop to be raised upon land undergoing an actual process of cleaning, as a crop that draws from earth and air, and yet gives all it obtains back again to the soil, as a crop, that when properly grown, is the most perfect preparation for barley, gives a bed upon which in the future year, seeds must catch, and as a necessary esculent for the consumption and healthy condition of stock in winter, the turnip is of inestimable value, and without its cultivation no farmer can carry on his business with success and healthy economy.

The turnip has been called in England the Keystone of scientific agriculture, and why? Because in the four course rotation on sandy lands, viz: clover, wheat, turnips, barley, upon the cultivation of the turnip crop depend the barley for a fine tilth and richness, the clover for that cleanliness which shall secure a good catch, and the wheat for manurial richness of soil, and cleanness of its clover lye. A turnip crop may not enrich the land, but it is in its right and thorough cultivation that a benefit is gained which is plainly marked for many succeeding years upon the land.

SOIL

Any land that is, or can be made rich by the application of manure, and that is, or can be made deep and friable, is adapted to the growth of turnips.

Now, as the light soils, of their own nature, fulfil the latter requisites, they are

generally termed root-soils, but the mistake very often made that it is next to impossible to raise turnips on a clay soil, is unsupported by fact. It is true that clay lands require more manipulation than those that are by nature lighter, nor do they require as often green cropping; but on the other hand, when the necessary conditions of a mellow state of the soil and a fine tilth are secured, the heavier soils will yield a far greater weight per acre of turnips. We know of soils in England, say the blue clays of the Severn Valley, which are found almost impossible to bring into such a fine tilth as shall secure a certain crop of turnips, but our experience of Ontario, and we have travelled in every section of the Province, has convinced us that there is no township in which the soil is so heavy and tenacious as to preclude the possibility by a careful and judicious preparation of perfect success in the turnip field.

A rich free loam is than the soil best suited to this esculent, and it should be the object of every farmer to bring his land as nearly as possible into such a form, to so enrich his light sand that it shall blacken and thicken into a loamy, and to so remove all surface water from his clays, so work and expose them to air and frost, as to reduce them to the friability of a clay loam.

SEED AND SOWING.

The Swedes now most prominently before the farmers of Ontario are "Carter's Imperial," "East Lothian," "Skirving's Improved" and "Sharpe's Improved," all being purple topped. Farmers will differ greatly upon the relative value of these seeds, and much of such difference of opinion arises from peculiarities of soil. Our own experience leads us to favour "Carter's Imperial" as a Swede for general cultivation. It is a seed of comparatively recent introduction, and as Swedes are not exempt from the law of nature that the seed of all growing plants, deteriorates by constant general reproduction, this variety has one great merit of newness. Last year, in which the season was one unusually hard upon the turnip crop, our "Carter's" stood the drought better than any other variety, and we have heard nothing but commendation of its merits from practical farmers who have tried it.

The "East Lothian" is a very perfectly shaped globular turnip, but seems to require a richer soil than the former variety to secure a successful crop.

"Skirving's Improved Purple Top" on the other hand, although a heavy cropper, is dangerous upon rich soil, from its tendency to run to neck; and we have heard several complaints of the same tendency in Sharpe's.

Of the Yellow-Turnip we consider that there is none superior to the Yellow Aberdeen. These of course are only fit for early feeding.

Of White Turnips, also for early use, we like the White Stone or Stubble. We have also heard practical farmers speak very highly of the "Noble Duck."

We cannot close this part of our subject

without a recommendation, endorsed upon every side, of the very high qualities of a newer variety, the "Grey Stone." We grew none ourselves last year, but were so struck with their appearance in a neighbour's field, that we made close observations and very particular enquiries. They have the advantage of all white varieties, that they can and indeed should be sown later than the Swede, whilst they will keep well into February, when carefully stored. They are very highly spoken of in the old country, and are immense yielders.

We have spoken already of the anterior cultivation of Turnips.

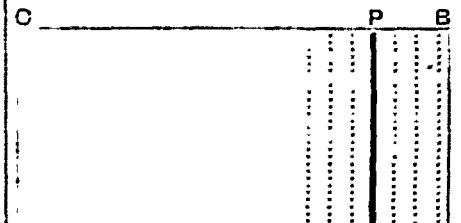
DRILLING.

Of drilling there are two kinds, the ridging, and sowing upon the level.

We prefer the ridgelets, though many excellent farmers adopt the latter plan. Our chief reasons are that the horse hoe can be run closer without injuring plants, and that the thinning out is more rapidly and economically performed.

Drills should be at least twenty-eight inches apart. They may be made with a double mould board plough, with a double furrow slice of the swing plough, or upon light and friable soils in a very expeditious manner with a single "bout" of the single mould board.

The keeping of a uniform distance between the ridges is most important, as although we have horse drills that will adjust themselves to the ridges, our horse hoe cannot be made self-adjusting, and consequently between carelessly drawn ridges, either plants will be cut out, spaces missed, or much time lost in the continual alteration in the width of cut. The two first plans of drilling up are well known to our farmers, but as expedition is often much required, we would explain a plan not usually practised, and which, by a single "bout" of an ordinary plough will make each drill. In this manner the regular plough



mould board. A B C D is the field. Say drills are to be 28 inches apart. From the corner A measure a distance along A D equal to any multiple of 28 inches, say 112 inches, or 9 feet 4 inches, to O; thus leaving room for four drills of the requisite distance apart. Measure the same distance along B C to P. Set up the stakes at O P, strike out the first drill from O to P; when arrived at P haw round and throw up another ridge, making 28 inches from crown to crown; again haw round at O, and cutting off the side of the first made drill throw out again; continue this process until the drills reach the side

A B, when a like number of drills will also have been made on the other side of the drill O P. Measure again from the furthest made ridge and drill up a new block until the new ridges reach those already made, and continue this process through the field. Each passage of the plough makes a ridge on the mould board side, whilst with the lan side it cuts off the edge of the former ridge. In nice loose land the soil will fall over the edge of the previous ridge just after the passage of the plough, and make it quite even. One member of our staff informs us that he prefers this plan upon sandy land to the use of the double mould board, as he says the ridges thus made are more compact.

MANURING.

It is hardly necessary to advert here at length to manuring. Suffice it that there are but two plans with barn-yard manure broadcast before drilling up, or if spread in the furrows and the ridges split to cover the manure. The objection to the latter is, that the manure is not as evenly distributed, and this is plainly shewn in a succeeding crop of spring grain, which is invariably more flourishing where every ridge has stood. Barn-yard manure is undoubtedly the best, but where there is a deficiency it may be well made up by what are called artificial manures.

First of these we rank bonedust. Let this and also superphosphate, or guano, be placed in immediate contact with the seed; plaster and ashes are better reserved to be spread upon the plant when it first appears.

The great secret of successful turnip growing is to force the young plant, and thus will it grow large before the "Fly" has had time to work destruction.

Let the sowing be done immediately after the last ridging, when the soil is cool and moist. An inch and a half is the best depth, and a covering with the roller where the land is perfectly dry the most effectual.

The after treatment of this crop we must defer for consideration in a future article.

Engl. Farming!

Professor George H. Cook, State geologist of New Jersey, after his return from visiting some of the best farms in England, made remarks on English farming before the New York Farmers' Club, as follows:

"Of all the other crops, the great wheat crops surprised me most. The English farmer may justly pride himself on his knowledge of this kindly cereal. Their wheat straw is stiffer than ours, and stands up better; the head is large, and the color bright and clear. The uniformity of their fields is remarkable; no bare, thin places; no wet places or winter-kills. Some fields that I saw would average thirty, some thirty-six, and others forty bushels per acre; sixty and sixty-four are often reported. One large field that I saw gave an average of forty-four, and I heard of an average of sixty-eight bushels per acre. That

wheat I did not see. But I am well satisfied that the yield is from fifty to one hundred per cent. beyond our American average. Now, how is this done? First—the English farmer does not expect good wheat except on good land, well manured. Second—he pulverizes thoroughly and makes the best possible seed-bed for wheat. He ploughs, cross-ploughs, then rolls, then harrows with a fine-tooth pulverizer; then he drills the seed, and covers from an inch to two inches deep, and if the soil is sandy, he rolls lightly again. On poor spots he sows a few hundred weight of nitrate of soda; and this special fertilizing brings up the thin places, and makes the crop even from side to side of the field."

J. J. Mechi, on a farm of 170 acres, makes more wheat and vegetable crops according to the size of his farm, perhaps, than any other farmer. He has grown eight quarters—sixty-four bushels—of wheat to the acre, on a field of seven acres. All his stall manure is kept under cover, and in the Spring he cultivates between the rows of wheat and applies 300 pounds of salt and guano to each acre.

Talk with Farmers.

"You ask me to tell you about my farm, and how I can manage to pay for my 300 acres, and have enough money owing to me, to pay for another hundred. Well, I do not deserve much credit, I assure you, for I have not done as well by the land, as the land has done by me. I have cropped it hard; too hard I am afraid, for the land's welfare, and perhaps for mine also in the long run. But you see, the land I own is specially good, and I often take two crops of wheat running, from the same field. The reason of this extreme fertility I hardly know. I live, as you are well aware, up towards the north west, and I had a hard time of it at first. Wolves used to take my sheep, and bears my hogs; but finally I overcame both marauders, and my stock has been safe from wild beasts, for some years, although now, and then, there is a stray wolf in the settlement, who does some mischief amongst the sheep. It is very easy to detect the ravages of wolves, from those of dogs, when a man has had as much experience as I have. And now I have as handsome a cleared farm, of two hundred acres, as you would desire to see, and another hundred still uncleared, of land equally valuable.

"Our buildings also are good, our stock abundant, and fine, and there are few drawbacks to our comfort and happiness. No doubt, I deserve some of this, as I have worked hard, and at first, lived equally hard, and have always endeavoured to take advantage of all chances to make money. So in one sense, my prosperity may be said to be fairly earned. Still few would have done as well as I have, if the land had not been good, and fertile; and it was all luck, for when I settled here, I did not know good

from bad land. I have often thought how different my present prospects would have been, had I happened to locate on poor, wet, or sandy and soil, as I so often see better men than I am struggling to make a farm of. Some men might succeed, but on poor land, a poor man's heart is soon absolutely broken; crop after crop, fails, and there never seems to come the abundant harvest, that he sees on other men's farms, and hence he is absolutely disheartened, and at last gets too poor to live on the land, and too poor to move away. Most lands in my section are all almost equally good, and hence are very high in price. In fact, cannot be bought for money as a general rule; yet the land does not look particularly good, when you examine it closely. But one thing I do notice, and I believe it a most important item in the selection of lands generally, there is a deep friable subsoil, and when I want two crops of wheat in two years, I put down the plough an inch deeper, and everything grows most luxuriously. Consequently, I consider a good subsoil absolutely necessary to a really good farm.

"As to Canada thistles and wild oats—we never sow the wild oats, and consequently have none, and thistles do not seem to thrive specially well with me and my neighbours. I have often seen such instances, in my travels through Canada,—where some sections are perfectly infested, and others are almost entirely free. Yet there are quite enough thistles go to seed to furnish a good general average crop, if the land had a great aptitude for them. Some of my neighbours also noticed this peculiarity, as well as I did. I have often seen new land fallows, that have laid unlogged for one or two summers, quite covered with Canada thistles, when the fallow was altogether surrounded by woods.

As yet we have grown but few turnips. Whilst we can get 20 to 30 bushels of wheat an acre, we cannot expect that many turnips will be grown. The time may come, when our wheat crops may fail, and we may then be compelled to make a change.

VECTIS.

Natural and Artificial Manuring.

The *American Rural Home* publishes a communication from F. P. Root, one of the best farmers of the State, on the subject of manures, in which he makes the following statement, showing the superiority of raising and ploughing in heavy crops of manure over a system of negligence, called manuring in the natural way. Two adjoining fields, divided by a rail fence, had been long under cultivation, and clover was often ploughed in as a manure for the succeeding wheat crop. The fence was taken away, and the whole, as one field, summer fallowed and sown with wheat. The strip where the fence had stood, and where the grass had so long grown and decayed on the surface, did not produce nearly the crop which grew on either side where the clover had been ploughed under.

There were strong reasons for this difference. The grass which grew and decayed on the surface afforded little else than vegetable mould. This could not enrich the soil several inches down; and did not possess in itself the fertilizing character of clover. The clover was ploughed in, and was ultimately mixed and diffused all through the soil, where the roots of growing plants were to penetrate. The vegetable mould remained only on the surface, and could only operate as a mulch.

We have heard such facts as this cited in proof of the folly of the practice of spreading yard manure on the surface, and never ploughing in. The truth is, this mode of manuring would be of little comparative use if it were practicable on cultivated fields. But fortunately the very act of cultivating works in the manure, and it cannot, as a matter of course, remain at the surface which the plough is throwing under. It is an excellent practice to allow spread manure to remain on the surface for a time, especially through autumn and winter, until the water of rains and melting snows diffuse the soluble parts intimately with the earth. When this is done, then is the time to plough under this enriched top stratum, and it will be worth double the same manure in lumps unmixed with the soil.

Top-dressing grass without ploughing under the manure is an exception, because the fibrous character of the roots serves to carry down the manure in solution, which could not penetrate the compact layers of bare soil. But turning under manure is often of great benefit even on grass—more especially on thin upland. Surface manuring on such land although beneficial to a certain degree, will not give it the power to grow heavy grass and withstand severe droughts. Men are apt to run to extremes, and having discovered the successful results of surface application in certain cases, they may carry the practice too far, and omit the deep, thorough and intimate diffusion of manure effected by solution, by thorough ploughing, and by repeated harrowing, which can alone supply a rich and mellow bed of earth for the extension of the roots of the crop.

Superphosphate of Lime and Roots, &c.

Johnson Leader, of Meaford, asks us several questions; an opinion upon which we shall endeavour to give practically and concisely.

First, about vitrolized bone—or bones dissolved by the agency of sulphuric acid.

Bones contain more than 53 per cent. of phosphate of lime, a little phosphate of magnesia, some carbonate of soda, and more than seven per cent. of nitrogen. Hence their principal value is owing to the quantity of phosphates, and we will speak of them as *phosphates*.

The object of diluting bones with sulphuric acid and water is to convert them into per-phosphates or superphosphates, and thus to accelerate their action as food and to bring

them into more immediate contact with the growing and foodseeking plant.

The apparent anomaly to which our correspondent refers, between science and practice in the fact that the former tells us that cereals cannot be sown where phosphates are wanting, and that by the latter we apply our phosphates to our root crops may be explained in this way.—Take wheat and swedes.—Wheat contains 15.26 per cent. of water. White swede contains 89.46 per cent. of water.

Taking this moisture from each they stand thus:—

Wheat—84.74 per cent. of food, other than water.
Swede—10.54

Out of these,

Wheat requires 0.50 phosphoric acid.
Swede 0.06

Percentage or the proportionate of phosphoric acid required by wheat and the swede is,

$\frac{.50}{84.74}$ is to $\frac{.06}{10.54}$ or as 91 : 53.

This greatly reduces the respective requirements of phosphates for wheat and the swede from that given when we lump the cereal or root and its contained moisture together.—And here the *working of nature* steps in to explain the position.—The growing root has a greater affinity for, or a greater power of attraction to itself, the phosphates contained in the shape of bones, while wheat cannot absorb them rapidly in this shape and requires them to be supplied for its use, absorbed and contained in barnyard manure, or other decayed vegetable matter.

In using what we may here call naked phosphates for our roots, we provide more than the crop itself requires. The excess is partly absorbed by cereals following for some years, while it is all in great part returned to the wheat crop in the application of well rotted barn-yard manure, for it is found that such manure contains no less than six per cent. of phosphates.

With regard to the application of bone dust to cereals direct, we have seen few thoroughly tested experiments. That it is of benefit to the cereal is undoubted, but we do not consider it advantageous to apply it thus directly, if in so doing we deprive our root crops of their usual dressing. We have ourselves, last fall dressed several hill tops on which is planted wheat with bone dust alone, and with bone dust and barnyard manure. We shall be happy to record the result for the benefit of our readers, and especially of our correspondent when threshing time has passed.

If applied, we consider the best method to be by casting broadcast upon the land after the last ploughing, at the rate of about 2½ cwt. per acre, and cultivating and harrowing it in previous to the passage of the drill.

The application of bones or bone dust, if wanted to push forward the turnip crop particularly, is usually made in contact with the seed; indeed, in the old country the turnip drill is so made as to sow the seed and the dust, or the vitrolized bone at the same time; but if we use the coarsely ground bones we like to put them between the drills, just previously to the last splitting.

Crops for Soiling.

The letter of "*A Subscriber*", Windham, is somewhat ambiguous. Our correspondent wishes in one part of his letter for our advice upon a *soil crop*, and in other part speaks of "some crop to sow upon fallow as a pasture."

For a soiling crop, both vetches and Indian corn are excellent, the latter perhaps the better of the two for general use. We should advise for making use of the summer fallow for soiling purposes, to first sow oats and vetches, about one bushel or two of vetches or tares, and two bushels of oats to the acre as early as possible. This crop will be fit to cut as soon as the clover has been secured.

Nothing will make food earlier than clover, except rye, which should have been sown in the fall. These oats and vetches should be sown at intervals of about ten days until the 1st of May. The first crop will be ready directly after the grass, and the latter ones will fill up until corn is about 2 or 3 feet high.

In May, as soon as danger of spring frost is over, sow your corn and continue sowing at intervals of about 10 days until the middle of July. Drill in rows at least 30 inches apart, so as to cultivate between and thus keep your land clean for wheat.

When the crop is about 3 feet high cut it. How much to sow at each interval must be determined by the number of stock, and the amount of food required over and above pasture.

For pasture upon a summer fallow. Rape is undoubtedly the best crop. To be used as pasture upon land preparing for Fall wheat, it would be the best to sow, as for turnips, in drills at least 12 inches apart, so as to admit of cultivating between the rows with the horse. Sow from 3 to 4 lb. per acre and do not thin out the plants. Sow in the latter end of May, or early in June, and it will come in for pasture (especially adapted for sheep) from the middle of July to seed-time, a period in which our pastures are most apt to fail. If sown broadcast, mix with dry mould or fine ashes, and sow at the rate of 3 quarts of seed per acre.

For raising extra fodder we would strongly advise Corn. Sow early, in rows from 28 to 36 inches apart, according to cleanness of land. After the corn is a few inches high slightly hll up with one horse cultivator; strew the corn in rows at from about 40 to 50 grains to the foot—according as rows are wide apart or closer together; and cut before coming into tassel.

Next come Millet, and Hungarian grass: of these two, the latter matures its crop in less time. Sow about the first week of June on thoroughly prepared land, broadcast, a peck to the acre. Be sure to cut before it matures its seed as the ripe grain has been found almost impossible of digestion, and therefore dangerous to cattle. It will produce a heavy crop of course strong fodder.

Fences.

(To the Editor.)

Sir—In the weekly Globe of the 1st inst. I notice a letter from "Farmer" on the subject of strait railfences. The plan he suggests of punching holes for the pickets with a crow bar would take more time than driving the pickets with a beetle. The pickets must be of equal strength and not too light. If I were near a cedar swamp I would prefer round pickets about four or five inches in diameter at the small end, to save the labour of splitting. The use of wire instead of pins and withes is a great improvement. The same idea occurred to me, but I concluded that when the expense is no object the idea would readily occur to any one. The short piece of rope is used to hold the pickets together while the holes are being bored, and it would also hold them whilst the wire is being fastened. Every bush farmer has not a screw, but every one has or ought to have a small piece of rope about his place; if wire is used the fourth panel will be commenced before the first is finished, and the pickets should be wired as fast as finished, lest a gale of wind should come on and loosen them. In that part of the Province of Quebec where I formerly resided as well as in this Township, we always have snow before we have severe frost, and if that is not the case in Dorchester "Farmer" will have to drive his pickets a little every spring; it is obvious that if the pickets are lifted a little by the frost they will settle down again by their own weight. Amongst the advantages of worm fences "Farmer" forgot to mention the facilities the corners afford for raising a crop of weeds and piling away stones that may be picked up for the surface of the land for the special accommodation of mice and ground squirrels. A staple gate much in use here is little more than an oblong frame, with the top and bottom rail slightly projecting, and upright bars a few inches apart, set in between them. Besides the end upright rail of the gate, a broader board or rail is sometimes used in the middle to strengthen it. To the projecting ends of the bottom rail, rollers are also sometimes attached, to facilitate the sliding of the gate back and forth. This gate is generally made wholly of cedar, and consequently is very light but I should prefer to make the small bars of straight grained white ash, and if near a saw mill, the top and bottom pieces of 4 x 4 hemlock studs, as being stronger than pine. But a tree may be cut in the bush and sawn down the middle; or two small trees may be cut and flattened on three sides with an axe. The flat bars are not generally used by the habitants, but they stiffen the gate very much; they should be of inch board about 4 or 5 inches wide morticed into the top and bottom pieces and secured with hard wood pins, whilst the other bars are wedged at each end. The small rollers are an invention of my own, and were

suggested by seeing some gates made by a friend of mine some years ago. He adopted my suggestion, and afterwards told me he found them a great improvement; the rollers may be an inch thick, and of sufficient diameter to project one inch above and below the bottom piece. If I were near a turner's shop I should have them turned out of hard wood and bound with hoop iron, but turning lathes and hoop iron are not always at hand in our backwoods settlements, in which case they may be sawn out of a round stick of a sufficient size, but unless they are bound with hoop iron they will soon split. They are not absolutely essential but they facilitate the opening and shutting of the gate. This gate is intended to slide endways along the fence, and a slab with the cut side upwards should be laid on the ground along side the fence for it to slide on. The top and bottom pieces may be eleven or twelve feet long, and the bars one inch in diameter, with a clear space of two inches between each. If used in a straight fence a third picket must be driven into the ground at each end to keep the gate in its place when closed, and a hole bored through the pickets to receive a hard wood pin, which must fit easy and be passed between two of the bars to prevent a particularly "cute" cow from pushing the gate back. I have known such a cow to lift back fence bars in that way, so that one end should drop and she could walk through.

Now here is a plain farm gate which may be made without a single nail by any one who can handle an axe and draw knife, and if the ends of the top and bottom pieces were bound with hoop iron it would tend to prevent them from splitting. Such a gate also presents the advantage of not being affected by any inequalities of the ground on either side, as it must slide back along the fence. I would also recommend that if possible no fencing should be cut till after midsummer, as any timber cut after that time, and brought out of the bush and split and barked immediately will last much longer than if cut in the winter. The only objection is the difficulty of sparing the time at the busy season, except in recent settlements, where the settlers after their crops are in, must work out somewhere to enable them to get along till harvest, and I would always rather pay a little more than have my fencing cut in the winter. Basswood rails cut in the winter soon become sap-rotten, but if cut after midsummer and split immediately they will dry rapidly and last longer than they otherwise would. All kinds of timber will last longer if cut in summer, and August is the best month. Even poplars, if cut in the summer, and allowed to lie till the leaves fall off, will be much harder than they would otherwise be, as the leaves draw out all the sap. This hint may be useful to our settlers in Manitoba if the Canada Farmer has found it's way there.

SARAWACK.

Salt as Manure.

T. R. of South Dumfries asks for some information as to the value of salt as a manure, &c. Our correspondent says, "now that salt is to be had in bulk at a low rate there is little doubt of its coming into general use, if the farming community could only be made aware of its value as a fertilizer." We heartily endorse these words, and believe with T. R. that salt especially on account of its comparative cheapness, is destined in a country like Canada, far removed from the influences of sea breezes, to take a prominent position amongst our fertilizers.

We have ourselves used salt, and are perfectly convinced of its great value, and that it is worth more on account of its comparative cheapness, than any other fertilizer upon light lands. We have at present a series of experiments under way, and shall be happy to give their results when the crops, upon which salt mixed with various other substances, and salt alone, have been applied, shall have come to maturity.

While nearly all experiments agree as to a great value in the use of salt as a fertilizer, the exact method of application, or the most economical and beneficial substances with which to use it, have not yet been fairly determined.

We trust that many of our readers will experiment and give us their results. It is only by such widely diffused experiments upon various soils and crops, and under different climatic influence that we can arrive at a true light and knowledge of the comparative effects of salt.

Its chief effect upon cereals, and especially on wheat, is to dissolve in the soil the silica which is needed to strengthen the straw, and to form a large part of the hull of the kernel.

John Johnson, than whom no sounder agricultural authority is to be found in America, found that under his high manuring, his wheat lodged quite badly, but that a dressing of salt remedied this evil, doubtless by making more of the silica contained in his soil available to the growing plant and thus stiffening the straw.

It has constantly been proved that root crops, especially mangold wurtzel, are very greatly benefitted by salt, and indeed require a great quantity.

The benefit of salt upon cereals is not so apparent as that of the nitrates or guano.

Upon these crops salt should be used (pure salt) at the rate of about 200 lbs. per acre in the spring, as a top dressing; for at this season the salt is more rapidly brought in contact with, and assimilated by, the roots of the growing crop.

We would sum up by quoting from Mr. Gardiner's prize essay on "Special Manures" laid before the Royal Agricultural Society of England, in 1869:—

"That all dressings and manures con-

taining a large amount of nitrogen, as guano, salts of ammonia, nitrates of soda, &c., make the grain grown by them lighter in weight per bushel, while at the same time they give more bushels per acre, as well as more straw."

"That on the other hand, such manure as common salt gives heavier grain per bushel, but fewer bushels per acre."

"That the most judicious and economical method is to use a mixture of these, as common salt with nitrate of soda, or any of the others, the one will give quantity while the other will give weight."

"That guano does not lessen the weight of grain quite so much as the nitrates of soda and potash, and that a mixture of it with salt would, there is reason to believe, become one of the best dressings for wheat crops."

"That salt will, in places far from the sea, in general be found advantageous as a dressing upon grain crops, although it does not bring away a rush of growth like the nitrates, it will be found, in such places, that it will cause the grain to weigh more and be of better quality in clearness of color and in plumpness."

Economise Manure.

We hope many farmers have already in operation the Dry-earth system; such as have not, should at least visit such a convenience in some neighbor's house and the incredulous will be very much astonished at the amount of valuable manure collected during the winter in the house of an ordinary sized family, and also at the perfect impunity from disagreeable odors, with which such may be handled.

There are, however, several manures too often allowed to go to waste upon a farm—amongst which we may write the following:

Hen manure. This most valuable manure is often wasted, perhaps leached with rain, and its goodness lost in the underlying soil, or left untouched. Hen manure is guano, and far richer for a given quantity of bulk. Turn the hen droppings out of the fowl house, if possible still keep it under cover, mix it with twice its bulk of earth, and make all into a snug heap; cover the heap with at least 6 inches of earth; if any ammonia should be escaping in a few days, the sense of smell will readily detect it, cover with more earth, until the escape of this valuable gas is prevented. It may be used just as guano, for it is guano, (home made and consequently unadulterated); use it for corn, or any kind of roots, but if possible keep it from immediate contact with seeds, as it is very strong.

The scrapings of the root cellars should not be lost, but incorporated with the manure heap. Ashes from wood, containing potash in large quantities, form a splendid top dressing for grass lands. Mix it with equal bulk of gypsum and sow broadcast.

Chips are not strictly manurial, but may

be used with great advantage, ploughed under with heavy clay, their effect is mechanical, and helps to keep clay from running together, and thus allow the soil to remain open to aeration and rains.

All refuse and garbage is, from its very state of partial decomposition, of value and should go to swell the manure pile.

It is astonishing what a pile of such stuff may be gathered up in spots where at present it is only rendering the air impure.

All these things are not only by their exhalations injurious to animal life, but are positively "wasting their sweetness upon the desert air."

We passed a Blacksmith's shop the other day and saw them sweeping the droppings which had fallen from the horses, constantly brought in to be shod, into the road. We asked if anybody ever took these droppings away, and were told, "Yes, sometimes they did, but oftener not." No farmer who knows his business, will ever allow such manure, the genuine article, to be wasted for want of a day's teaming, even should he pay cash per load. We should like to have a month's hauling of such manure, on to our own farm. We think it would pay better than teaming sawlogs or cordwood.

Swindling the Farmer.

An American exchange gives the following account of a glaring imposition which has been recently detected and exposed. The publication of the fact may serve as a warning to the credulous: "Suspicion was aroused that there had been fraud and deceit practiced in the branching corn business in the manufacture of sample stocks bearing four, five and six full-grown ears. These samples were sold by Mr. Judson at enormous figures to agents canvassing for the sale of packages of corn, and the wonderful stalks were such strong and undeniable proof of the variety's very prolific nature, that every sucker who occasionally heard that "like produces like," bit at once and invested stamps in Judson's corn. Mr. Stewart, of this city, (Chicago, Ill.) was swindled into purchasing considerable territory and several of the wonderful stalks—paying as high as \$25 each for the latter.

The crash came at last. Judson was arrested in Chicago for swindling; waived examination, gave bail, and fled. Things began to show symptoms of foul play all around the board, and Mr. Stewart determined to investigate, hence the dissection of his samples. Briefly, the result of the examination was about as follows: One sample having four ears was made up of two stalks neatly joined at a joint, having a pine dowel-pin about eight inches long to give the s. lice strength. Each original stalk having two ears to begin with, the alliance formed by means of the pine stick, "doubled the crop" in a manner not fully explained in the Judson circulars.

In other stalks, in which no dowel-pins were found, the ears were closely examined and three out of five were found to be irrefragably glued on."

The estimates of the beet sugar products of Europe for the present manufacturing season somewhat exceed 1,000,000 tons, a small increase upon the product of last year. France will make about 350,000 tons. The business is yearly extending.

The cultivation of the poppy in France is steadily increasing, and it now occupies about 50,000 acres, of the value of 4,500,000 francs, yielding opium to the value of 2,000,000 francs per year. Different samples of opium raised in various parts in Europe yielding from eight to thirteen per cent. of morphine.

REDUCING BONES.—In the discussion of wheat culture, at the late agricultural convention in Newport, N.H., Mr. Pattee, of Warner, gave a formula for reducing bones, as follows:—Place them in a large kettle, mixed with ashes and about one peck of lime to a barrel of bones. Cover with water and boil. In twenty-four hours all the bones, with the exception, perhaps, of the hard shin bones, will become so much softened as to be easily pulverized by hand. They will not be in particles of bone, but in a pasty condition, and in excellent form to mix with muck, loam or ashes. By boiling the shin bones ten or twelve hours longer, they will also become soft. This is an easy and cheap method of reducing bones. If the farmer will set aside a cask for the reception of bones in some convenient place, and throw all that are found on the farm into it, especially if one or two dead horses come into his possession, he will be likely to find a valuable collection at the end of the year, which would prove a valuable adjunct to the manure heap.

TRANSPLANTING BEETS AND RUTA-BAGAS.—A correspondent in the *American Agriculturist* thus writes on the subject of transplanting root crops:—Another year's experience makes us confident that the recommendation to grow mangolds, beets, and ruta-baga turnips by transplanting is practical and worthy of extended trial.—By the transplanting process, the plants are grown in a seed-bed, where they are all preserved to repay the cost of their care. The seed is sown early in May, and while these plants are growing to the proper size for transplanting, the harrow is keeping the field free from weeds at a very cheap rate, and the setting out will require less labor and cost less money than would a single one of the three hand-hocings required in the other system. The transplanting is done late in June or early in July, according to the state of the plants in the seed-bed. As the plants are pulled the tap-root is cut off and the leaves shortened to four or six inches. The planting is done by a dibble. Furthermore, the plant is benefitted rather than injured by being removed and trimmed, all the imperfectly developed plants are rejected, and the final result will be a much better crop than can be grown in any other way.

Stock Department.

Growth of Combing Wools.

To the Editor.

Sir,—Will you permit me the use of your columns to give the farmers of Canada a little information on the growth of combing wools, and the breeding and feeding of sheep.

As I said in a former letter, published a little time ago in the *Globe*, the Leicester breed is that which best suits the soil and climate of Canada, at least that portion containing lime in the soil, or that is underlain by limestone rock; that ingredient of the soil, strengthens the staple of the wool, and helps to give it the necessary lustre, which is one, if not the most desirable quality of combing wool, and which the manufacturer must have.

The Lincolnshire, Norfolk halfbred, and Northumberland are also very desirable sheep, and a careful cross between the Leicester and Southdown, produces a fine wool, of a grade much sought after by makers of medium yarns, and readily fetches a high price. Sheep farmers will have to give more attention to the breeding and feeding of their sheep: fineness of the staple, combined with length, strength, and especially lustre, is what is wanted; the competition from other countries, and the wants of manufacturers will compel them to do so, if they wish to make the keeping of sheep profitable.

The yarns most in use in the United States are from Nos. 32 to 60, of which Canada can only furnish wool to spin eight numbers, say from 32s to 40s, and a good proportion of our wool will not even make 32s; such wool has to be sold by the dealer or manufacturer at a loss on first cost, which of course comes directly out of the pocket of the grower, who were he to turn his attention to the proper breeds, would receive the amount so lost. The Leicester is only when well bred and well kept, suitable for 32s to 36s, therefore the other breeds, and judicious crossbreeds, must be kept to supply wool for the finer yarns, say 44s, which is the leading yarn in the American market, at present, and will be for years: the tendency is to the fine long wools, of which it is not now possible to obtain by the most careful selection, much more than half enough to supply the demand. The Canadian farmer, however, if he has the will, can do a great deal towards supplying that demand. It is a well known fact that we do not keep one half the number of sheep the country is capable of sustaining, and I will earnestly request farmerst to give this matter a large share of attention; it will take a little time and perseverance, but in the end will most assuredly pay them, and if properly adhered to, will raise and keep Canada's present good reputation for combing wool.

All coarse and heavy woollod sheep, such as Cotswolds, &c., should be sold or otherwise disposed of, such wools are not wanted,

as foreign wools of a similar grade can be imported cheaper. "The indiscriminate sale of lambs" is a very great mistake. In round numbers not less than 500,000 were exported last year, besides a great many killed here, which might have been spared, and old sheep killed instead, resulting in a loss to the country (from these two things) by difference of weight of fleeces between a young and old sheep, of at least \$500,000, and I am satisfied even more; and the gain to our American cousins in the clip of wool alone was nearly \$1,000,000 which they quietly pocketed, and chuckled at our shortsightedness, and stupidity, in selling them the best of our flocks at mutton prices.

Close or inbreeding should not be practised or tolerated; it destroys both wool and mutton; breeding, and aggravating many of the diseases which the sheep is heir to, and is the greatest enemy to success in sheep farming. Farmers should join, say every five or six, into clubs, buying their bucks, in different parts of the country, and from entirely different flocks, and change them with one another every season, and after, say three years, sell them and infuse new blood into their flocks again in the same manner. Agricultural journals and country papers, would greatly benefit the farmers by circulating all the information that can be obtained on the scientific breeding and feeding of sheep, and try to get the country into the English system. Care and science in the above is what has brought English, Irish and Australian wools to their present high grade of excellence, and is still improving them.

After good and careful breeding, proper feed and care is the next consideration. The sheep should not be allowed to roam about the barnyard, or country side, picking a bite here and there, but be well and warmly housed, have plenty of good feed, such as hay and good straw, with a little unthreshed pea straw, or chop stuff, and plenty of good turnips, which latter are most essential, adding as they do, more perhaps than anything else, to the lustre and quality of the wool; in early spring they should be gradually put on the grass, and not turned out in cold wet days, which has a very injurious effect on the staple of the wool, making it harsh and brittle at that part of its growth, or cutting and tightening the bottom of the fleece, both of which make the wool much less valuable, as such fleeces are shunned by the buyers of worsted wools, for the loss in preparing and combing such wool by noiling is enormous; plenty of shelter should also be provided against the heavy rains of summer.

Farmers can by attending to the above facts, and others mentioned in my former letter to the *Globe*, improve the value of their wool fully ten cents per pound, which on a year's export amounts to \$250,000, no small amount to make by a little attention to a useful domestic animal.

Wool at present is exceedingly high, but has fallen very considerably in the last few

weeks, and is still going down in the English and American markets, as manufactured goods have not risen in proportion to the rise in raw material, consequently lower prices may be expected to rule; and manufacturers are very chary of buying stock ahead.

The greatest care and attention must be paid to the wool in washing, and bringing to market in good condition, as dealers have every year to be more particular about grade and quality, and doubly so, this year.

WOOL DEALER.

Advantages of Thoroughbred over Common Stock.

A correspondent of the *National Live Stock Journal* says: "No man can properly estimate the advantages which will accrue to the farmer by keeping good in preference to poor stock. In 1831, my father removed from Bourbon county, Kentucky, to this (Vermillion county). At that time there were very few Short-Horns in the State; but we had an English stock of cattle even then—the Teeswater and Loughorns. My father, when he came to Illinois, brought twenty-one cows and heifers, said to have been the finest herd of cattle which up to that time had ever crossed the Ohio river at Cincinnati. The produce of this stock gradually spread all over this part of the country, and certainly made a grand improvement on the common stock. Then land was worth \$1.25 an acre, and we could afford to raise common stock, and with a free and unlimited 'range,' and corn at ten cents per bushel, we could afford to raise common stock. But now our farms are worth from \$60 to \$100 per acre, and we are compelled to resort to better stock. When the interest on one acre is \$10, and it takes two to two and a half acres to graze a two or three year old steer, we must have the best stock to secure a reasonable compensation, and cannot afford to fool away our time on mongre's. There is a vast difference between the compact massive Shorthorns or their grades, and the leggy, lathy steers with which the country abounds. The former will come in one year earlier for market, besides bringing a better price, because they have more good meat in the right place, and of infinitely better quality. I have heifers at two years old which weigh 1450 pounds, and some a little under two years which weigh 1300 pounds, and have eggs which weigh from 1900 to 1986 pounds, (this last being *Jessie Hopewell*). Now no one can approximate such weights, in such time, with common stock; and even for beef purposes, if a man is going to raise cattle merely for beef, it will pay handsomely to provide himself with thoroughbred stock.

Mr. Morris Shellard, of Galt, has sold to Mr. H. Julien, of Colchester, for eight hundred dollars, a fine young stallion, which has received the name of "Young Defiance of the West."

Sheep.

To the Editor.

SIR—I read with pleasure your very excellent articles on "sheep," but you must pardon me if I take exception to one or two points.

1, I consider that sheep missing having lambs, or having them late, is in a great measure due to too many having been served by the same ram. My experience as a shepherd in the old country is that fifty is the maximum number of ewes that should be allowed to an aged tup; and of course the number for one raising two years, should be less, both for the development of the animal and vigour of the offspring.

2, I believe your advocacy of having the lambs come in the first half of February to be wrong. To have them at this cold season in Canada, is to have a loss of nearly fifty per cent., even under the most favourable conditions, as they perish from the cold.

If they are shut up in houses where the temperature is sufficiently high for the safety of the lambs this will be found to be injurious to the sheep, which as you correctly state, must not be kept too warm. Those so kept confined are very liable to suffer from pulmonary complaints.

Those early lambs which survive are, as a rule found to be stunted, and do not thrive as well as those which come in the latter part of April, and first of May, which is the best time.

You lay particular stress in having them come early, so that they may be in "season" when fifteen months old. Should they be February lambs they will be that age, a year from the following May. I cannot see that that will much benefit the owner for breeding purposes as they will be that age at any rate should they come at the proper season (latter part of April and the first of May) when, according to NATURE, they are in "season," which is during or after the frosty nights of Autumn.

I can hardly agree with you "that the ewes will take the ram better in the warm days of September than later." The reverse is the case; when the nights are frosty more are in season, and a succession of frosty nights, will show at the proper time, if the tup is with the ewes, that there will be but little difference in the ages of the lambs.

To prevent ewe lambs of four and five months from coming in the following spring I always "patch" them. Very little time is lost in thus securing them, as the "patch" can be attached to the wool with a darning needle armed with woollen yarn.

Particular attention should be paid to the selection of the ram; which is at his prime when two and three years of age. He should never be kept more than two seasons, as after that his own progeny may be coming in, and consanguinity will certainly result in an inferior offspring.

Some of the principal points in determining a good animal, are short legs, a long body square in front and behind, also above and below, with a good coat of long fine wool, and having the front of the face from the eyes to the tip of the nose long, with the latter rather turned up.

If superior animals are required, the best time for the lambs to come is when the ewes are three years old at least. The period at which they are in their greatest vigour is when they are three, four and five years of age. Unless it is a superior animal it is not profitable to keep it after it is five years old. One reason so many scrubby sheep are to be found on nearly every farm is that the rams are either too young or too old, which, although the ewes may be good, give but poor lambs. Another is that buyers are permitted to pick the best lambs whilst the inferior are kept; thus the flock is allowed to run down.

As connected with this subject, you will permit me to draw attention to a habit prevalent among many of our farmers, which leads to the destruction yearly of many sheep by dogs. I refer to leaving dead lambs in places where they may be devoured by dogs. Besides, when sheep are slaughtered the dogs are allowed to lick up the blood, which thus gives them a taste, which many of them put in practice when they cannot get anything else to satisfy their hunger.

Old country shepherds would never allow their colly dogs to touch a dead lamb, or the blood of a butchered sheep.

M. MCG.

Roxborough, March 8, 1872.

Past and Future Prices of Stock.

Experience of the past should guide our future.—Last Spring store cattle were high in price, and generally in poor condition, and consequent on the protracted summer drouth did not make the usual progress that grass cattle ought to do. The want of plenty of water was against their doing well, and this was severely felt in almost all sections of the country. When, therefore, they were marketed in the fall, prices were low, as well as quality comparatively medium. One Grazer and Cattle Dealer stated as the result of his summer experience, that he did not clear four dollars a head in the Autumn, over the price paid in the Spring, when usually he would have cleared at least ten dollars on an average on each beast. As autumn feed gradually decreased, numbers of cows were sold at very low prices. Fodder was expected to be very scarce and consequently high in price, hence many sold their dry cows as they ceased to give milk at very low prices, rather than winter them. Now these very men regret what they have done. It is true fodder and hay are very dear in some sections, but not exorbitantly high in others. I was aware of a barn full of hay near Mitchell—beyond Stratford—that could be bought for nine

dollars a ton, and there were somewhere about forty tons more or less. The proprietor in this case has probably been mistaken, having avoided buying stock to consume the hay, on account of its scarcity elsewhere. So with many farmers and their hogs. In the Autumn pork was cheap, and farmers feared to winter over their hogs, and preferred making sale; next year hogs will be high, and it would have paid far better to have wintered nine-months-old hogs, rather than selling or killing them. Last Autumn they probably would have weighed 140 to 150 lbs. each, next Autumn they will weigh nearer 300 lbs. each, and the same grain will make them 200 that would have this year made them 150 lbs. Whereas some coarse feed and slop would have wintered them at a nominal expense; and a hog that was only worth \$5 a hundred this winter, will probably be worth \$7 next Autumn, showing a great difference between \$21 gross return and \$7.50. It is so with many fattening animals, if they are carefully and economically kept over, and above all things are kept warm. Dairymen could not over-hold their cheese, as it will not keep, but I always consider it an unwise policy to sell a good cow. Ten years since I bought a very likely-looking Canadian cow, two years old; I paid \$13 for her; I have resisted selling her many and many a time at fifty dollars, she was so good, in fact she was super-excellent—and last summer I sold her for fifty-one dollars. She was then 12 years old, and were she young I would not have sold her at sixty dollars, had I even been obliged to buy or borrow food to winter her on, so strongly do I object to parting with a first-rate cow. Almost anything else can be replaced on the farm but the wife and the cow—always provided they are super-excellent in their way. Learned men say that during the current year there will be great floods of rain, and probably fodder will be cheap, but in all probability, of inferior quality. If this rainy season comes, the American corn crop will be short, as it is perfectly well known, nothing hurts corn like cold protracted wet weather, especially in the early stage of its growth. If it once turns yellow and spindling from this cause, there will be a most certain and wide spread influence to cause a short crop, and thereby better prices for pork. The same influence will no doubt affect also the price of cattle and beef. A little consideration on these points will often put a great many dollars into the farmer's pocket.—C. D.

BREEDING STOCK FREE OF DUTY.—The law of Congress, passed in 1870, admitting of domestic animals imported for breeding purposes from "beyond the seas," is henceforth to be construed by the United States Treasury Department as including in its operation such animals imported for the Dominion of Canada, and all other foreign countries.

Gestation of Cows.

The period of gestation in cows being a subject that has from time to time attracted considerable attention, we publish the following by J. H. Pickers, given in the *Newtown-Lore Stock Journal*:

In forty-five Short-horn cows and heifers, producing fifty-four bull and fifty-two heifer calves, of which accurate time, in days, has been kept—no reference having been made to calves that were "slipped"—the average time that bull calves were carried was 253½ days, heifers 251½ days; the average time of the whole one hundred and and six being a fraction over 252½ days.

The greatest variation was in the time of carrying heifer calves; the shortest period being 255 days, and the longest 299 days, making a variation of forty-one days. The shortest period of bulls was 270 days, the longest 285 days, being a variation of twenty-five days. But six calves were dropped at 280 days—the time usually counted as the average time—of which, four were bulls, and two heifers. Only three were dropped at 252 days—the average time of the herd, two heifers and one bull.

The age of the cow seems to make no difference in the time of gestation. The shortest period was in a cow, three years old, with her second calf; the longest, in a cow carrying her fourth calf—both heifers, as before observed. The shortest period of carrying a bull was in a cow carrying her second calf, and the longest was with the second calf. The greatest variation in one cow, was in a cow carrying a bull 283 days, and a heifer 262 days, the difference being twenty-six days. The cow that carried the heifer 258 days, carried a bull 276 days—her longest period—a variation of eighteen days. The 253 days heifer was of the average size when she came, and is now three years old. The 299-days' heifer was also about the average size.

Buying a Horse.

First, acquire a knowledge of horses, so as to know a good horse when you see one that is a model. There is more money lost, and more honest men are defrauded, in buying and selling of horses, than in any other product of the farm. For the last twenty years, I have had all sorts and shapes of horses, from the pony to the Shanghai, and the greatest weight in the least bulk, is the animal for service. A horse weighing from 1100 to 1400 pounds, is large enough for farm work. You must understand what you want an animal for, before you go to buy. One minute is long time enough to examine the standing points of a horse. These are: A good lively eye, inclined to hazel, and a pleasant countenance; a flat leg and open foot; shoulders set rather back, and thin at the withers; a short back, and no objection if it is slightly arched; the proper shape of

the hinder parts depends on what you wish the horse to perform.

The prevailing blemishes are blindness or weak eyes, ringbone, spavin, hoof-bound, curbed or thorough-pinned, stilled, &c., all of which an expert observer will detect in one minute's time. The heaves is the most difficult to detect, as that depends upon the treatment the animal has had for the week previous. The thumps, or palpitating of the heart, may be detected easily, by moving and exciting the horse, and stopping him suddenly. As to the age of a horse hurting him, it depends upon how he has been used until he is six years old; if sound then, he is good for twelve or twenty years service yet. Judging the age of a horse by his mouth, is very uncertain. You can tell to a certainty within one year until he is six years old, then you must judge from general appearance. Some judges rely on the tusk, but some horses never have any tusk—about the same number of mares have tusks as horses that have none.

Some men will tell you that they know the age of a horse by the jaw, or the wrinkles about the eye, or by the joints of the tail. You might as well say that you know the age of a man by the wrinkles in his face. The wearing of the teeth depends upon the general health and lungs of the animal. Bad teeth follow diseased lungs.

In purchasing a horse, rely upon your judgment, and when you trade, do not ask a neighbor, as every man ought to know his own business. If there is much talking to be done, let the other do it. What you say, let it be to the point, and stand to it.—*Ohio Farmer.*

Mr. Bowly, of Siddington, Cirencester, whose herd of Short-Horns is one of high as well as long standing, had a public sale April 25th, (conducted by Mr. Stafford), at which the very high prices given in the following summary were obtained:

	Average.	Total.
18 cows,.....	£162 11s. 6d.	£2,926 7s.
12 bulls,.....	138 17 3	1,666 7
30 head,	£153 1s. 9d.	£4,592 14s.

The bull 2d Duke of Tregunter sold for 900 guineas, and 6 heifer calves sired by him, average £220 each. But one of the chief points of interest connected with the sale, is the fact that it illustrates so well the prices at which Short-Horn cattle of similar quality are now selling in England as compared with three years ago. On the corresponding day in 1869, Mr. Bowly had a sale at which the following figures were realized:

SUMMARY OF MR. BOWLY'S SALE IN 1869.		
	Average.	Total.
25 cows.....	£93 19s.	£2,348 17s.
14 bulls,.....	35 0	490 7
39 head	£72 16s.	£2,839 4s.

It will be observed that the average was more than doubled.

Abuse of old Horses.

I feel a deep sympathy for old horses. It is a common practice in this country to make old horses break the colt and to often work with them for years. It is hard for an old horse to work with a colt or a young active horse. Old horses, like old men, are often capable of performing more hard work than some young ones who can beat them for an hour or more. The old man wants to take a moderate jog and can hold out all day; but a little immoderate exertion for a few minutes unstrings him perhaps for all day. An old horse driven at the top of his speed for a few miles spoils the day's journey. When once made sore or strained, the result is stiffness the next day. The old horse should not haul his load to town and then be forced to trot back. It does not injure him as much to do heavy work with slow motion, as to do light jobs at the fast gait.

Again, the old horse requires more time to eat his meals and rest his nerves. Of all animals the old horse is the worst abused. Although he has been our most faithful and profitable servant, yet in his old age the lash is applied to force out his youthful vigor. The older he grows the more he feels the lash. He is often turned out of doors to give place to the colts. Too often the neglect and abuse he is subjected to, because he is a little old, results in a greater loss than is made up in the care of the young horse. The last part of a horse's life may be more profitable, if rightly used, than the first part. There is more comfort and less danger in working old horses. We understand them and they understand us; and we should be as willing to conform to their nature, as they are to conform to our wishes. It would be more humane as well as more profitable to use them as they should be, as long as it would pay, and then take them out and shoot them down. But the wicked practice is to knock them about as much as they will bear to pay well, and then trade them off to some more inhumane wretch than themselves. The old servant is gone among strangers, and he receives no sympathy in his last extremity.

We do not blush to say that a man who has enjoyed the profits and pleasures of a good horse, as long as he was profitable, and then shoves him off among inhuman jockeys, is an inhuman, treacherous, and suspicious friend.—The man who does so without regard to how the horse may be cared for, is, in my estimation, of a suspicious character; and I never see horses abused so as to excite pity, but my sympathies are directed to the man's wife and children also, if he has them.—*Ohio Farmer.*

Mr. R. Adams, Woodstock, has sold his Bulls *Matchem* and *Butterfly*, and the young Bull *Symmetry*, to Mr. W. C. Hull, of Baker City, Oregon.

My Experience in Cooking Food for Stock.

Many years since, and before we left England, my father had a steaming apparatus, carefully but cheaply constructed, to cook mangolds and turnips for our hogs. My father indulged the hobby, at intervals of professional engagement, being what in those days was called, a "Gentleman Farmer," and was in consequence often greatly ridiculed by those who had been accustomed to quote the sayings and doings of their fathers, and grandfathers, as the very best guide they could have, despising all others as savouring of book farming.

Now, this state of things, my father never could abide; but then he probably lived before his time. He was always reading and thinking and carrying out what he read and thought.

Some things were certainly failures, for he lived, as I said, before his time. But on the other hand, many others were a perfect success. Most of the farmers in our neighbourhood at that time were absolute, and obstinate, in all they said and did. When therefore my father erected a small steaming apparatus for cooking food for hogs by steam, the works were visited as a show, on a small scale, and more often condemned than otherwise.

He used them however for years, and until we came to America, and our hogs did infinitely better, for the innovation. In fact they were reasonable pork at all times, and the food they consumed, consisted almost always in winter of steamed roots, mangolds, swede turnips, and potatoes, with a little bran, rarely any meal, and then only given to those whose condition required better food, and would pay for it.

The bran was not cooked, nor did it require to be so treated, as when the boiling hot roots were dumped into the cistern, with each charge of roots, there was a thin layer of bran scattered over, and amongst them, the heat was quite sufficient, to entirely gelatinize the bran, and also the small particles of meal adhering to it. The sweet syrup of the roots, combined with the starch and albumen of the bran, caused fermentation, and the food thus made proved exceedingly good.

When used without bran, and fermentation, it was found to produce scouring, in the hogs.

He did not at that time, try steaming dry food for cattle, but subsequently he did so and with very good results.

To accomplish this latter addition to cattle food, and make it remunerative, requires some outlay, and also that the business should not be conducted on too small a scale, as it is manifest, the same labour and steam, required to steam food enough each day for five cows, would also prepare food enough for five and twenty.

A tub was made, of sufficient capacity to contain forty-eight hours, food, for the stock,

intended to be fed. An outside board covering was placed round it, about six inches from the tub, but completely to encircle it.

The cavity thus formed, was entirely filled with saw-dust. Chaff would do nearly as well. This arrangement, effectually kept in the heat. The tub had two heads, and a small hole in the upper one, and a draw hole at the side, near the bottom over the false bottom, under which the steam was introduced. The chaff or cut hay, and straw was dumped in and spread about, and about half a bushel of barley or pea meal per cow, per week, was gradually mixed with it. When the tub was sufficiently filled the steam was applied; and in about one hour, and sometimes half-an-hour, the mass of food sufficient for twenty cows, for twenty-four hours, was entirely cooked. If the wood used, was dry and the tub ready filled,—as there were always two one being emptied, and the other preparing, the whole was often completed by breakfast time of a winter morning. The heat was carefully retained by the outside covering and kept all warm until next day, and indeed, when a double charge was done for Sunday, the feed was never cold on Monday morning. Fuel was freely used, and also wood ashes to prevent souring. The tub being once weekly washed inside with it.

The quantity of milk and butter produced by this mode of feeding was very great, and I should have said so. When spring came the cows were in the order, and were never allowed to be dry more than a couple of weeks, and it was not a mark.

He thought that the acidity of the food from the tub, was not good, but never noticed any ill effects.

The tub was sometimes covered with a wet straw cover, it was not fit. Hurdle racks were absolutely necessary, and they had little or nothing to do during the intervals of milking times, but prepared the mash, and attend to the rest of the stock, and the mass of splendid manure was an item of value in itself.

As for hogs, there cannot be a shadow of doubt, that a very great benefit is derived by cooking their food. But at the same time, it must be borne in mind, that the time occupied each day in cooking the food for ten hogs would be equally as great as if fifty were to be so fed, whereas the profit would not be more than one fifth as much.

In constructing such a cooking apparatus it is also absolutely requisite to have plenty of steam. A mere cloud of steam will not do, and this is another reason why a large business must be done if it is to prove remunerative. To do work as fast as is here described, there must be as much steam as will pass through an inch pipe at a pressure of at least twenty pounds per square inch in the boiler. But of course much less steam will do, provided there is more time allowed to do the work.

VECTIS.

Veterinary Department.

Warbles in Cattle.

To the Editor.

SIR,—In passing through my barn-yard the other day I chanced to lay my hand on the back of a three-year-old heifer, on which there were several lumps about the size of a pigeon's egg. On examination I found a small hole in the top of the lump from which I squeezed a white grub, about three quarters of an inch long by three eighths through, as near like a potato grub as anything I can describe. If you would be kind enough to explain this, stating what the grub is, how it gets there, the effect it has on the animals, &c., you will greatly oblige a

YOUNG FARMER.

The small tumors very often seen on the skin of cattle, contain grubs, which are deposited under the skin by the *Cestrus bovis*.

This fly, during the end of summer and beginning of autumn, pricks its victim and deposits under the skin its ovum or egg which grows into a larva, and during the following spring makes its escape in the form of a grub. It is rare that these warbles do much harm to the animals, except they appear in very great numbers.

Glanders in Horses.

To the Editor.

SIR—This is the most fearful disease to which the horse is subject. It is provoked by stimulating food, combined with exhausting labor. Youth and high feeding, combined with excessive labor and damp lodgings, will produce glanders. Age, starvation, and careless toil generally induce farcy. The glanders and the farcy are, however, one and the same disease modified by the causes which originate them. Glanders is the more vigorous form of the disorder—farcy is the slow type, fastening upon general debility.

Is there any law in Canada, which will aid us in cleansing the country of this fearful disease? Last summer a horse was brought to me for examination that was entirely "rotten" with glanders. I ordered that the horse should be immediately destroyed. The horse was taken from my premises and given to another person, who was mean enough to take him to provoke his neighbor, by putting him in a field near the line fence adjoining his neighbor's pasture field.

A few days after the neighbor came and asked me if such a horse (describing him) had the glanders. He said that the horse stunk so bad that the stink reached his house nearly half a mile distant. I told him that the horse had the dreadful disease. He asked me if there was any law relative to that disease, as he was afraid that his horses in the adjoining field would get the disease. I

told him to see a lawyer, about it, who told him to wait till damage had been done and then to collect the damages from the man who kept the diseased horse, and who was obliged to shoot the horse about a week after. Suppose the man with the horse to be worth nothing, what then?

Why is the legislature behind the medical profession in the extent of its recognition? Any man may now drive a glandered horse through the country without fear of punishment, endangering the lives of unsuspecting wayfarers, whom it is the especial province of the parliament to protect?

HENRY MENG,

Norham, Percy.

VEL. SURGEON.

Tumour in a Cow.

A correspondent from Ancaster gives the following account of a case of internal tumour in a cow:—"Yesterday I lost a two-year-old heifer; she was in excellent order, and was seen in her loose stall box at ten o'clock at night apparently perfectly well and eating heartily. She has shown no signs at all of ill health. On examining her, *post mortem*, I found a tumour filled with very offensive matter attached to her side, between the heart and the liver. Would this be the cause of death? Are such internal tumours common among young cattle?"

A tumour such as above described, would be very likely to cause death; such tumours however are uncommon in cattle.

SWELLED LEG IN A MARE.—A correspondent from Dorchester, writes to enquire concerning the nature and treatment of a swelling in the hind leg, with which a mare in his possession has been suffering, attended with loss of flesh and general failure in condition. The animal is apparently affected with a disease known as Inflammatory Oedema, and as no relief has been afforded it is likely to end in a permanent thickening of the limb.

The mare, however, should be moderately fed, and the leg well hand-rubbed several times a day, and one drachm of Iodide of Potassium may be given morning and night until eight doses are given. As the mare is in foal it is not advisable to continue medical remedies too long; and it is likely the run at pasture during the time she is suckling her colt will be of benefit. Blisters should not be applied in the treatment of such cases.

WORMS IN PIGS.—In answer to our correspondent from Ancaster, we recommend him to administer a purgative, as one or two croton beans, which may be given in the food. Turpentine also is a very good vermifuge, and one drachm may be given in two or three ounces of linseed oil, and repeated every second morning until three doses are given.

The turpentine and oil should be thoroughly mixed and cautiously administered.

The Dairy.

Canadian Butter Trade.

It is not more than ten years since French butter has been considered an important article of commerce in the London Market. The reason it occupied such an important position is mainly on account of the manner in which it is handled, and in my opinion their method is exceedingly beneficial to the farmer, shipper, provision merchant, and retailer: and, what is more essential still, it pleases the consumer. In most of the principal towns in Normandy and France there is a day appointed in each week for a butter market, and on these occasions the buyers meet the sellers, and from 25,000 lbs. to 50,000 lbs. will change hands in lots of 6 lbs. to 50 lbs. each, which are brought in by the farmers' wives. The buyer goes round and makes his selections at the prevailing price for that day, he then puts his purchases into wicker baskets holding about 200 lbs. each, and takes it home. The next day it is kneaded or worked by machinery, which is simply a process of washing in clear spring water, to get the butter-milk and other impurities thoroughly extracted; it is next salted at the rate of 5 lbs. of salt to 200 lbs. butter, and again washed, so as to liquify the salt, and put into firkins. This butter, for instance, will be brought first hand on Monday; the following Monday it will be in the London Market, and invariably sold out by Wednesday.

We will take the Cork Market as an example of the Irish method of manipulation. The farmers bring the butter into the market in quantities of from one to twenty firkins. In some weeks there will be 12,000 firkins in the market. This butter is bought before being classed. There are about five inspectors who class the butter, and it is graded into six different qualities by this method. The buyer is apt to lose unless he is a good judge, and will probably have first, second, and third class butter, when he only wants first. When the butter is graded, the firkin is branded with an iron, and the quality "scribed" on. No butter is allowed to go out of Cork Harbour unless it bears the Cork Market "scribe" on the firkin. Thus English buyers are very safe in ordering whatever quality of Irish butter they require, at the prevailing price, of the agents in Cork, being sure to get the quality they order. If this or some similar system were adopted in Canada, it would be of the greatest benefit and would induce our dairymen to make a better article than they do at present; but with the present mode of manipulation, an English buyer would not be safe in ordering any large quantity at the quotations of our buyers here.

The Dutch system is very inferior to the foregoing methods and would be no criterion for Canadians to go by. Their butter is an

inferior article, not equal to the Irish or French. This is in consequence of the low marshy pastures which are flooded over by the sea at certain seasons of the year, giving 50 per cent. of their butter a fishy taste, especially during the winter season. Each dairyman makes about 50 lbs. or 100 lbs. per week and brings it into market at once, after which it is immediately shipped, steamers going to London twice a week, carrying from 3,000 to 6,000 casks each. This butter is consumed within a week of shipment.

Canadian butter should rank A 1, in the English Market instead of No. 4, as at present. 50,000 firkins sold on an average last season at sixty shillings, which should have brought ninety shillings if properly handled, which is a dead loss to Canada of 135,000.00 dollars, besides a bad reputation for our Dominion. The proper way for the farmers is to have a good airy cellar, and give the milk its proper time; churn the cream twice a week, put 6 lbs. of salt and 1 oz. of salt petre to every 100 lbs. of butter, and work it through the butter; and then have a firkin made of white-ash or oak, properly soaked, and put a cloth in the bottom of the firkin, and pack the butter tight, and keep it properly covered from the air; and when full put a cloth on the top, with 1 lb. salt and a little pickle, head it up, and don't keep it too long before selling. Our butter is better than it was ten years back, but we are behind our neighbours across the lines yet. They are doing their best to rival us Canadians in this article, but if the farmers' wives and daughters of this Dominion are true to themselves and country, they will come off victorious in this particular. If you give it your proper attention and pack it yourselves, and bring it to market and get your cash for it, as farmers do with their wheat, &c., you will get the benefit yourselves.

I. T. B.

Guelph.

The Correct Weight of Milk.

Mr Gail Borden, of White Plains, N. Y., who conducts an establishment for preparing condensed milk, has been making some experiments for the purpose of determining the correct weight of crude milk. He took the milk of several cows and mingling it together, and then thoroughly cooling it, he carried it directly to the "U. S. Sealer of Weights and Measures," who measured and weighed the milk by accurate Government weights and measures. The result was that a quart of milk, so measured and weighed on delicate scales, was equal to two pounds, two ounces, and one quarter of an ounce (2 lbs. 2 1/4 ounces.) The tests were made, with different samples of milk at different times, but without materially altering the weight. Mr. Borden has adopted the above as a true weight of a quart of milk having a fair average quality. Hence any person who buys milk may determine by weight, with satisfactory accuracy, whether he receives a quart when he is required to pay for that quantity.—*Prairie Farmer.*

Dairy Farming in Scotland.

About one hundred years ago the farmers in Ayrshire, having generally small holdings of tenacious soil under a cloudy sky, began to make cheese for sale. The cheese was called "Dunlop," from the district in which it was first generally made. The small hardy breed of cows, now so widely known as "Ayrshires," was gradually developed. These cows are good milkers for their size, and probably yield more milk upon inferior soil than any other breed. The race evidently owes much of its good qualities to its descent from the ancient Ayrshire Highlanders on the opposite shores of the Clyde. Dairy farming was found profitable, and has gradually become the chief cattle husbandry in the counties of Linlithgow, Renfrew, Ayr, Wigtown, Kirkcubright, and Dumfries. The "spotties" are also now creeping up many of the straths of Dumfries and Galloway, much to the disgust of the ancient Gaul, who sees with great chagrin the displacement of his much-loved handsome West Highland kyrie. In the six counties first named there are in all 134,000 cows, and, including the dairies on the skirts of neighbouring counties, it will not be far from the mark if we assume that the produce of 100,000 cows is made into cheese in the south-west of Scotland. There is little or no dairy farming in the eastern counties. As each cow produces, on an average, $3\frac{1}{2}$ cwt. of cheese in the summer half of the year, the total produce of cheese in these western counties will be about 17,500 tons. The best of the cheese made in the large dairies is worth about £72 per ton, but taking the whole into account—what with inferior, and cheese made late in the season—the average price will be about £60 per ton. This amounts to £1,050,000, and the whole of this goes for rent and tenants' profits, as the expenses of manufacture are more than met by the other casual profits from the dairy. Wherever the system has extended, the rents of suitable farms have increased beyond any other. This $3\frac{1}{2}$ cwt. of cheese is made from the beginning of May to the middle of November, a period of about 190 days. As it requires about five quarts of milk in summer, and about four-and-a-half in autumn, to make a pound of cheese, each cow must yield about nine quarts of milk as a daily average during that time. The dairies run from seventy or eighty cows down to twenty; it is not reckoned profitable to make cheese from a smaller number. The foregoing figures give a return of £10 10s. for cheese from each cow, and practically that is just about the mark. One young calf for each six cows is reared to keep up the stock, and the rest are sold when a few days old to the large towns on the Clyde, where the consumption of "Staggering Bob" in April and May by the swarthy workers in coal and iron must be something prodigious. In winter the milk is churned into

butter, or, if within a few miles of a railway station, is sent to Glasgow from distances of fifty miles. The whey is reckoned to bring a pig for every three cows, from the sucking stage to that of a porker of 130 lbs. or 140 lbs. weight. These profits do something more than pay for wages, fuel, and other costs of management—including the cost of 10 st. of bean meal bought for each cow in spring. In summer each cow will consume the grass of about two acres of land rented at 30s. per acre. In winter she has straw and litter, and, if possible, a few hay for two months in the spring. About three tons of turnips are allowed each cow, partly consumed in autumn and early winter, and partly in spring. In this way she consumes the herbage of about four acres, the farmer has, besides, of course, the oats thrashed from the straw. Till within the last fifteen years the cheese made was wholly the old "Dunlop" cheese, but the Cheddar system was then introduced, and is now universal in all the large dairies. The manufacture is simpler, and the cheese brings 3s. or 4s. more per cwt. Cheddar cheese is not richer than the old Dunlop, but it is much sooner ready for use, saving the factor interest of money and warehouse charges. The Scotch makers now consider they make as good Cheddar cheese as that of the West of England, and challenged the English makers to meet them at the great Scotch Cheese Show at Kilmarnock. The challenge was declined, and it is intended to send samples from the best Scotch dairies to meet the English makers on their own ground next year. The county of Wigtown is said to produce the best cheese in Scotland. It is a common practice on many of the large farms to let the cows to a sort of midleman, called a "bower." The farmer provides all the necessary implements, and the "bower" nothing but his skill and the necessary labor. The rent is fixed at so much cheese, the "bower" paying at the rate at which the rest is sold, if he has not the full tale to deliver. He makes a very good thing if he can pay the rent with the cheese, and has all the casual profits to pay himself and the servants he has to hire. A head dairywoman, capable of taking the entire charge, gets from £25 to £30 a year. These skilled damsels are very scarce, as they soon save money, and are desirable matches.—*The Field*.

Dairymen are too much in the habit of killing their calves—saving only the skin, and then purchasing cows as needed, from the scrubs sent to market. This is a very short-sighted policy. The cow is the stock-in-trade of the dairyman, and his efforts should be directed to producing the best possible cow for milk. This can only be done by long and careful breeding. He should have a bull from one of the most approved milking breeds, and then save the heifer-calves of his best milkers.

Cooling Milk for the City Market.

The shippers of milk to the Chicago market have, as a rule settled down on this plan of treating their milk: They have discarded the use of all appliances that cool the milk very suddenly and have given up the use of ice. A can is filled with milk, and is placed with the cover off, in a stream of spring water, till the temperature of the milk is very nearly the same as that of the water. The milk is not stirred while the cooling process is going on. Most milk farmers have a cooling vat of a capacity four times as large as the milk vessels that are placed in it. The cans are placed on slats near the bottom, and an arrangement is made whereby the cooler water from the spring flows in at the bottom, while the water warmed by the milk flows off from the top. The water should stand an inch over the body of the can. With good conveniences, milk, in ordinary sized cans, may be cooled in about thirty minutes. Where farmers have no springs, they rely on water pumped from wells. When the milk has been cooled in this manner the covers are put in place and the cans are covered by blankets if they are exposed to the sun. Nearly all dairymen now unite in the opinion that milk is injured for any purpose by being cooled too suddenly, as by the use of ice or the employment of patent coolers. They also agree that warm milk should not be mixed with that which is cold, as is frequently done by pouring milk into a can that already contains milk cooled by the use of ice.—*Prairie Farmer*.

A late number of the *Irish Farmer's Gazette* states that the authorities of Dublin, finding that imposing a fine does not stop the practice of adulterating milk, have resorted to the expedient of advertising in the morning papers at the expense of the guilty parties, the names of those convicted of the violation of the statute in relation to adulteration. It then gives a copy of a displayed advertisement which sets forth that—"At the Northern police court, on Saturday the 17th, February, 1872, James Kelly, dairyman, 72 Mountjoy street, was fined two pounds, for selling milk adulterated with 20 per cent. of water, and it being his second conviction for a similar offense, the publication of this advertisement was ordered by the magistrate who heard the case."

Cow insurance companies have been organized by Ohio dairymen.

HOLDING UP MILK.—A writer in the *American Agriculturist* says he has found his cows will always let down their milk when inclined to hold it up if he gives them some salt to lick.

It is estimated that China will be a market for American butter and cheese to the amount of 50,000 tons annually. This is equal to 100,000,000 pounds. This is the amount they will want as soon as our markets can supply it.

Poultry Yard.

A Plea for Poultry Exhibitions.

To the Editor.

SIR,—It was with mingled feelings of regret and pleasure that I read your report of the meeting of the Ontario Poultry Association: regret at evident internal commotion, and pleasure at the prospect of another Exhibition being prepared—perhaps held before this reaches you. When I see the *Canadian Poultry Chronicle* and many American Poultry publications with numerous advertisements, it is a satisfaction to me to perceive that our beginning in the Canada West Society, as it was first called, has certainly tended to this result; and although no one knows better than I do the hard work, difficulties, &c., of getting a Poultry Exhibition up, still after seeing so many persons advertising I felt that a show must sooner or later be held again, or the cause would dwindle. On our first attempts our endeavours were well responded to by the citizens of Toronto; and any clear sighted man, especially the hotel keepers and feed store proprietors must see the advantages to themselves that would result from an increase in poultry. Again, wood is required for fowl houses from lumberyards; wire, nails, hinges, locks, food dishes, water cans, &c., from harkware stores; baskets from the baskets makers, and “dry goods” comes in with pink calico for the more tasty or coarser stuff for others, to line baskets, &c; and I cannot exclude the painters and glaziers in a country like Canada where a covered run is desirable for chickens; and finally, whitewash from lime burners; and flowers of sulphur to mix with it, and tonics, &c., from the chemists; and work for printers by advertisements, &c.—all these make it clear that the community generally derive benefit from the encouragement of this “fancy.” And lastly, finally, and in conclusion, as divines have it, the poultry vendors and consumers of fowls and eggs are benefitted, for they should get better and larger birds and fresher and a more abundant supply of eggs. There is no doubt that these results have been realized in the old country. I found but little difficulty in my first attempts at getting donations of plate, cups, &c., for our first show, from the firms in Toronto, and I am sure that if properly represented the Society will be again liberally supported, and a five dollar subscription from each member would ensure safety to all. Why, Mr. Editor, we started a show in Dublin not long since—on nothing. It cost us between thirteen and fourteen hundred pounds sterling, yet the Society was not one farthing out of pocket. You would not require the same number of dollars. This I know, for I managed the first two shows—and only wish I was within reach to assist at another—and that the cocks may still be kept crowing in the capital of Ontario at a large Poultry Exhibition is what I hope to hear of.

F. C. HASSARD.

Poultry Houses.

It is not enough that poultry houses should be so constructed as to keep out the cold in the winter season, they must also freely admit the heat and rays of the sun. The direct and beneficial influence of the solar and luminous rays on animal and vegetable life is so fully understood, as to require at our hands no special demonstration—our every day experience teaches us that. It is enough for us to compare those who pass the greater portion of their lives in the open air, and in the sunshine, with those who are secluded from it, either by business occupation, or obscure dwellings, to notice its effect on health and life. It has been proved that the quantity of carbonic acid exhaled by an animal increases with the intensity of light, and attains its lowest limit in complete obscurity, and as all animals in the act of respiration consume oxygen, and exhale carbonic acid, it will at once be admitted how necessary it is that a large supply of the former should be secured, especially so for poultry, as will presently be seen, when kept confined in houses, or small yards. It is to the effect of the sun's rays we are indebted for the oxygen we consume, and unless the supply is equal to the demand the noxious effect soon becomes visible as well in men as in animals.

But as respiration in fowls is effected more completely, extensively, and actively, than in any other class of similarly constituted animals, their average temperature is higher. This extensive development of the respiratory process is due to the fact that air is admitted in fowls not only to the lungs but also to the interior of a greater or less number of the bones, and to a series of air receptacles which are scattered through various parts of the body, the quantity of oxygen therefore consumed by poultry is greatly in excess of any other class of the vertebrata, and on the sufficient and continuous supply of which their health and profit depends.

It will be conceded then that the free admission of the caloric rays of the sun into poultry-houses is as essential to the health and recuperative powers of fowls, as the food they eat is to the sustenance of their bodies—they constitute the incessant and periodically renewed source of power and life not alone in fowls, but in all other animal life, and to their influence we must attribute the many blessings we now enjoy. The study and application of nature's fundamental laws are as essential to the rearing and keeping of poultry, as mating and crossing is to the production of pure breeds. When they are properly understood and acted upon, and their beneficial effects utilized, the now too frequent complaints of the unproductiveness of poultry will become less general—and the sooner we apply ourselves more thoroughly to the task the better. The first and not

the least important part of which is the proper construction of our poultry-houses.—*Canadian Poultry Chronicle.*

Montreal Poultry Exhibition.

An Exhibition of Poultry, Singing-birds, and Dogs has been held under the auspices of the Montreal Poultry Association. The *Canadian Poultry Chronicle* gives the following account.—For the purpose of holding a show the Association amalgamated with the Agricultural and Horticultural Society, thereby securing the united efforts of a larger number of people; and the success of the Exhibition showed the wisdom of the proceeding. It took place on the 19th, 20th and 21st of March, at the St. Patrick's Hall, in the City of Montreal, and was largely patronized by the public notwithstanding the severity of the weather during the time of its being held.

No efforts were spared by the committee of arrangement to make this Exhibition the best ever held in the city, and in this respect, they were highly successful. Uniform coops, nearly 300 in number, beautifully and neatly constructed, and arranged on long tables the entire length of the Hall, with wide passages between, allowing visitors ample room to pass to and fro, and view their occupants, added greatly to the effect produced, and made a decided improvement over former exhibitions.

The most numerous class was that of the Brahma, of which there were about thirty pens; next to them came the Gold and Silver Poland, which were perhaps equalled in number by the Cochins,—the other varieties being all well represented. Of turkeys, geese and ducks there were a goodly number embracing several wild specimens. The Pigeon class was well represented, and shows the estimation in which they are held by fanciers. Singing birds gained prizes, and dogs added to the interest of the exhibition, and contained among those shown several good specimens of the respective breeds.

IMPORTED COCHINS.—Mr. H. M. Thomas, of Brooklyn, writes:—“I have just received (from Henry Tomlinson, Birmingham, England), another coop of most wonderful, nice buff and white Cochin Hens. They arrived in very fine condition, there being not a feather soiled or ruffled on them. They are already laying. Mr. Tomlinson, very kindly (at my request) sent them in larger coops, which gave them far more room than the last ones he sent me, and which had come in very bad condition. Mr. Tomlinson says that the reason he sent the other lot in such small coops was because breeders in Canada who had ordered from him before had ordered them to be shipped in small coops, to save charges. For my part, I would sooner pay a trifle more charges and have my birds sent out in good large coops, which insures them a safe trip and good health.”

Correspondence.

Prizes.

To the Editor.

SIR—In your March number you make some remarks on "Prizes as an incentive to good farming," showing that as the prize list now stands it hardly reaches the ordinary farmer, and also making some suggestions for improvements. Perhaps you will allow me the privilege of making a few observations on the same subject. The following remarks are not made in a spirit of fault finding, nor with any desire to throw blame on any of the parties who have from time to time got up the prize lists or managed the exhibitions, but to lead to enquiry whether equal justice is done to all classes of our farmers.

As I understand the matter, the object of the prizes offered by Agricultural Societies generally, is twofold, first, to encourage the best kinds of farming by offering rewards for the best crops, the best implements, and the finest animals; and secondly, to render the exhibitions so attractive by an assemblage of rare and interesting objects and animals, that a large multitude of people may be induced to attend and pay the accustomed fee of admittance, to help to meet the expenses necessarily incurred.

If you take the prize lists of the last Provincial Exhibition, and examine them, you will find that the sum of \$3450 is offered for prizes on cattle, while those offered for wheat, barley, peas, and oats, which may be looked upon as our commercial staples—the crops upon which a vast majority of our farmers depend upon for a living—the amount offered for these four is the sum of \$228, or if you add the Canada Company's \$100, and \$50 that was specially offered last year for hybridized wheat, it amounts to the sum of \$378—a very little more than \$1 for these four crops to \$10 for cattle. Now, most, even those who set a very high value on fine cattle, will think that a little more than the fair share for the live stock; and assuredly the man who should introduce a variety of wheat, for instance, that would in all soils and circumstances produce two bushels an acre more grain, over our million and a half of acres, than the wheats we now have—such a man would be a greater benefactor to the country than if he had introduced the best bull that ever crossed the ocean. In five years the produce of the wheat would have benefited more people, would have extended further over the country than the progeny of the bull would in fifty years. I have now before me the prize list for the first Provincial Exhibition held in Toronto in 1846, and at that time the case was even worse, for they then offered, of money prizes, besides some books the sum of \$180 for cattle, and for the four grains above mentioned, they offered the sum of seven dollars.

I have often thought how much more advantageous it would be to the farming community, if a part of the many thousands of dollars that are every year paid in prizes to the best looking horses, cattle, sheep, and pigs (many of which may be of very little benefit to any person but their owner), and to the most promising looking ploughs, harrows, cultivators, seed drills, or reaping mowing and threshing machines, and to the finest and fairest looking grains and seeds, or the biggest or most monstrous looking roots, the most showy fruits and flowers, or the most numerously pieced quilt, or the most laboriously wrought and flowered handkerchiefs, and to many other such like things, how much better it would be if part of that money was expended upon trustworthy and carefully conducted experiments on the best, the cheapest, and easiest methods of making, composting, and applying manure, so as to produce the most immediate effect upon our various crops, and the greatest permanent benefit to the land; or by experiment proving what was the best crop or plant, or mixture of plants, to grow for green manure on our different varieties of soils; or what was the best and cheapest manure to apply to our different root crops, and the best time and method of applying them; or an experiment showing the relative value of the various roots and grains grown for feeding purposes, either for milk or fat, and the most profitable method of using them. In fact the subjects are almost innumerable on which we require facts—certain knowledge that can only be got by carefully conducted experiments. These experiments to be of real value are too costly, the risks are too great, they require both too much time and money to be undertaken by private enterprise; and therefore there are very few that either know how to perform them properly or will undertake to do so with the merest chance of being paid for their trouble; since many of the experiments tried will be a loss instead of being profitable to them. Very few experimenters in agricultural processes become rich.

Let me touch on just another matter whilst I am writing on this subject. Could not the Board devise some better plan of paying the prizes after they are awarded? The scenes at Kingston last year on the Friday during the time of paying the premiums were far from creditable. Surely the managers might easily find means to pay as fast as the secretary can make out the lists. They can take money at half-a-dozen gates, surely they could arrange to pay at more than one window. Perhaps, however, it might be as well not to pay at the time of the exhibition, but send the amount to the parties entitled, since they obtain all the addresses when the entries are made. In that case, could not the Board arrange that other Banks besides the Bank of British North America would pay their cheques without mulcting each receiver of twenty-five cents as is now

commonly done, no matter how small the sum may be. Farmers are not generally good customers to the Banks, or perhaps that small charge would not be made.

Cobourg.

W. R.

"My Farm."

To the Editor.

SIR,—Yesterday I had business in our market town, and as I usually make it a rule, if possible, to pay my expenses with a load of some product when I have to go to town, I took down oats. On reaching the market my load was placed in solitary grandeur, there to await the advent of buyers. The market clerk offered me 40 cents per bushel. Now, upon the day previous I had oats that were worth 42 cents, and therefore I considered this offer, and came to the conclusion that his plan was to test me. If I were green and unposted in market prices he would have re-sold my load to a regular buyer at perhaps 42 cents, a matter of a cent under the market price, and thus have made his dollar and a quarter in a few minutes. I afterwards sold for 42 cents. I mention this offer as warning my brethren of the plough that there are many such sharpers, even clothed as market clerks, who would instantly take advantage of any ignorance of market prices on the part of the seller.

Not considering the question, whether market clerks should be allowed to speculate in grain or should be disinterested men, I would ask your readers to move, upon every occasion, for a more substantial footing upon which to place the system of selling farm produce. At present a farmer is little better than a huckster, driving his wagon load to a public square, and there sitting to barter with buyers, be they many or few. In England and in many parts of the United States corn exchanges have been established, and the business carried on in them is more satisfactory both to buyer and seller, and is certainly performed in a more honorable manner than is seen in the present system of bartering on the street.

There comes a wet day and the farmer has 50 bushels of grain in the wagon, and exposed in the open street. How quickly does the buyer take advantage; he knows full well that that load cannot be drawn home again, perchance a distance of ten or twenty miles, and if the buyers choose to combine they can force the market down or up for twenty-four hours or more without trouble.

It matters not that we farmers know, that by quotations of other markets, the price is at too low a figure, we cannot draw it home under a considerable price per bushel, and the dishonest buyer must have it almost at his own price.

How often do we see this work done in the barley season

To-day there are few loads in the market, the buyers combine and give high figures, the quotations reach the country, and to-morrow there are ten times the number of bushels in the market. This is exactly what the buyers had expected, and they then let down their prices and make plenty of profit to pay for losses, numerically small, upon a previous day.

This is drawing the market, and could not be exercised in one city or town were we to sell by sample.

When the great demand arises for any given grain, let us deliver large quantities at the warehouses, but do not let us peddle thousands of bushels and thus place ourselves under the daily control of speculators.

OLD COUNTRY.

Ancaster, April, 1872.

Fish Manure.

In a recent number of your journal Mr. George Makinson of Newfoundland, requests information relative to keeping fish manure from premature decay. A few years since, being largely engaged in fishing and fish curing operations in Great Britain, my attention was also turned to the above subject. Having tried many experiments I found the most simple method was to salt the refuse fish and offal, then boil at leisure, then pulp and put into suitable canvas, press out all moisture with a powerful screw; the oil was saved, the cakes were sun dried and ground into any degree of fineness required. It kept well.

A neighbour of mine reduced his offal with dilute sulphuric acid and added ground kelp to give it body.

Another incorporated the offal with superphosphate of lime, the quantity of water in the fish serving to dilute the acid, it being dried up by the natural heat of the process.

I have thus endeavoured to reply to Mr. Makinson's enquiry about fish manure as briefly as possible. There can be no doubt of the value of the article. The supply is practically unlimited, and the demand for a good material would be enormous. The samples manufactured by me were valued at £8 sterling per ton; that at Concarneau at £7 10s. per ton, but their oil sold higher than ours, and so about averaged the prices.

The progress of migratory shoals, such as mackerel, herring, pilchards, &c., is as regular, deliberate, and unconcerned after centuries of fishing, and, I may add, as numerous as ever. Nor do I fear that the increasing demands upon the shoals of cod fish on the banks of Newfoundland have either alarmed or lessened the quantity of fish. The fact is, so enormously prolific are all species of fish, of the edible kinds especially, that the idea of exhaustion is absurd.

In 1854 the catch of cod at Newfoundland was about 1,500,000 tons, and is said to be

increasing greatly, which, if we reckon the fish to weigh upon the average 8 lbs. each, will give the number of 392,000,000 of cod fish. Now, as the roe of one full grown fish contains one million eggs, it would require only three hundred and ninety-two fish to supply the whole take, supposing all the eggs were to fructify.

I have known 20s. sterling per ton paid for fish offal and inedible fish for conversion into manure, and it paid a fair profit, but in these seas and coasts, swarming as they are with fish of all sorts and crustacea, it could be obtained at a much lower cost. The facilities offered here are most inviting, capital and requisite knowledge being all that are needed to develop one of the most profitable resources of industry within the scope of my knowledge.

THOMAS WADE.

St. Edwards, Prince Edward Island.

Queries

To the Editor.

SIR,—1 What is best to do with manure in which there is a quantity of Charlock seed?
2. What is the cause of "cotted" wool?
3. What shall we do with sheep producing it?

R. ETSIL.

1. Pile it in the barn yarn and pack it down tight, turn in a few weeks again, and if possible add refuse lime, muck, &c.,—in fine, so thoroughly rot the manure before using it as to destroy the germinating power of the wild mustard or charlock seed.

2. Bad feed, want of attention, careless selection of rams.

3. Kill them for mutton.

The Canada Farmer.

TORONTO, CANADA, JUN 15, 1872.

Canada in 1871, or New Empire in the West.

It is not unusual for young countries to be misjudged and underrated by the people of older communities. We in Canada have been rather unfortunate in this respect, partly on account of the glittering progress of the Republic to the south of us, whose advancement was extraordinary, and whose citizens lost no opportunity of impressing the fact upon the world, and partly because our Provinces were till quite lately detached, and individually small and unimportant. Now we are united, have an immense territory, and feel sufficient confidence in our country to vaunt our resources and our faith in the future.

Canadians have felt on many occasions, that they did not receive fair treatment at the hands of their fellow-subjects from

England who have travelled on this continent or written about it. They have often been hurt at the slighting, contemptuous way in which Canada was disposed of in a few lines, or, at the most, a few pages, while volumes of fulsome flattery were devoted to the United States. Sometimes we were favoured with a contemptuous sneer at our lip-loyalty, often with ill-natured suggestions that we were a burden to the mother country, and should be cast adrift to make our own way.

Latterly there have been signs of improvement; and we are moved to refer at this time to the subject by the perusal of a lecture delivered a short time since before the Russell Institution, in London, by Capt. Duncan, R.A., on "Canada in 1871, or our Empire in the West." The lecturer, instead of giving the greater part of his time to the United States, devotes himself to a tour through Canada, from Halifax to Niagara, and goes back with an honest intention to do justice to this country—to lay its advantages fairly before the public, and to urge upon his countrymen at home the great heritage they have on this continent, the immense value it is to them as a field for emigration, and the importance of maintaining the connection, and diverting the stream of emigration from a hostile country into a part of the Empire.

After all the sneers we have had thrown at us about our lip-loyalty, our want of spirit, and our mercenary motives in retaining British connection, it is gratifying to find one doing us such full justice as Capt. Duncan has done. He says:—

"There is often in young nations, as in young children, a faith which is most lovely; in an absence of doubt and fear which may violate all the laws of logic and yet tend to build up and strengthen the Commonwealth. Of all that I saw in Canada in 1871, nothing struck me so much as the unmistakable growth of a nationality out of the colonial chrysalis, and with this growth the existence of that faith and hope which are at once the characteristics and the mainspring of a young country's progress."

Again he says:

"In no part of our Empire, in the year 1871, did the sun shine on more manly independence or more unswerving loyalty."

Capt. Duncan sees in "our Empire in the West" a great opening for the overcrowded population of England, and with great vigour advocates Government aid in England to send emigrants to this country. He shows in the most powerful terms the folly both of Canada and England in allowing thousands and hundreds of thousands of loyal subjects to become absorbed

in a foreign and hostile country, while we have an exhaustless supply of fertile land lying unoccupied. He seems also to have been much struck with the demand for labour apparent everywhere in Canada:—

"On every farm, on every railroad, in every town I entered in the Dominion of Canada I heard the same cry, 'More men! more men!' while here, in our grinding poor rates, our crowded work-houses and gaols, and our beggar-swarming streets, I hear the cry, 'Too many men! Too many men! Men to murder! men to steal! men to die of hunger in broad day, while their fellows look on!' And yet we will not feed the want of the one with the surplus of the other."

"Oh, was ever such a ghastly farce played before heaven, as our Parliament wasting months over questions of suffrage and party, when our brothers and sisters, God's own creatures, are dying round us, body and soul, body and soul! In our own Empire in the West there is need for every one of them, room for every man to earn his living, and for every woman to learn what a home means, and yet they are kept here to starve."

While Captain Duncan urges so strongly his question on the English people and resses it upon the English Government, he has looked closely into the emigration arrangements at Quebec and Halifax and seems to have been struck with the indifference of our people, and the active, pushing energy of the Yankee agents, who swarm in our ports, and use every effort to entice emigrants to the States by tempting offers of employment, and by free tickets on the railways.

"The Province of Ontario, and to a small extent that of New Brunswick, alone do anything to advertise the advantages they have to offer, and it is not easy to say which makes an observant traveller the more impatient; the supineness of the other local governments, or the blindness of our own, in suffering thousands of our best children to seek an alien home, possibly to become our enemies, when so small an effort would divert the tide of emigration to the most loyal of our dependencies."

Captain Duncan evidently does not understand the wheel within the wheel in our political world, which causes this apparent supineness. He does not know that our representation is based upon population, and that the greater the population of Canada the less will be the relative proportion of the French to the English speaking people. He could not know that by the treachery of Ontario politicians the French could have sufficient power to keep a Frenchman as the working head of the emigration department, to act as a clog upon the movement,

to throw obstacles secretly in the way instead of removing difficulties. He does not know of the efforts of the French to prevent English speaking people from settling in the country, nor would he be in a position to hear of the efforts they are making in Belgium, Alsace, and Lorraine to recruit their numbers from those countries with foreigners, whose great qualification is the fact that they are foreigners and not British. Of course, an observant traveller could not see through this manoeuvring in a hurried trip through the country; and, even if told of it, he would hardly believe that a British people would submit to it for one instant. We hope the comments of an impartial traveller, ignorant of our political intrigues, will convey a lesson to the people of Ontario on this question of emigration.

The lecturer writes very fairly against the policy of withdrawing the troops of England from Canada, but says it has had a beneficial effect on the Dominion, since it has compelled Canadians to look more to their own strength to develop their own military power. He speaks highly of the efforts we are making, by camps of instruction, to increase our power of defence. The force of 40,000 volunteers, he says, is a historical finger-post.

"It has taught the United States that the future which Canada has pictured for herself is not that which they so fondly dreamed and so loudly boasted, but connection with England while England wills it, and independence should separation be inevitable." "And this is the country which our press dares to lecture on self-defence; a country whose danger being in its connection with us would alone, one would imagine, make us dumb; a country whose armed force, if it ever takes the field in real war, which God forbid, will do it not as the army of Canada, but as the advanced posts of our own army—the army of the Empire in the West."

We shall make one more extract from Capt. Duncan's lecture, in which he pays a compliment to the capital of Ontario:—

"There is generally in every country some city—not the metropolis—which singles itself out as the leader in all political or intellectual movements. Of the latter Edinburgh was an example in Great Britain early this century; of the former Manchester was a type at the time of the Corn Law movements. In Canada the lead is being taken, and nobly, by Toronto. And it is not a lead in which popular cry is valued irrespective of political ballast. It is a grand thing to see the faith in a country's future which is to be seen in that city; for true faith begets genuine work, and no prophet is needed to tell the future of such a land."

The whole lecture is vigorous, eloquent and manly. Canadians welcome gladly all respectable travellers from the old country, but they seldom get so fair a return as Capt. Duncan has given.

Public Lands in the North-West.

It is very important that the intentions of Government in reference to the lands of the North-West should be known as fully and distinctly as possible. We therefore draw particular attention to the Bill which is at present passing through the Commons on this subject, and to the explanations of it made by Mr. Morris on Friday afternoon. It will be observed that the lands are to be disposed of partly under the homestead system—which we suppose means Free Grants—and partly under that of direct purchase. Under the former arrangement certain settlement duties of course must be discharged and actual residence is indispensable; while under the latter the payment of one dollar per acre will secure the issue of a patent at once, and the absolute right to deal with the land as private property. To check speculation, however, and prevent large blocks being kept unimproved in order to secure enhanced prices by surrounding settlements having been made, no single individual is to have more than 640 acres sold to him or her.

This is all very well, but very careful management will be indispensable, else this regulation will be a dead letter. In many parts of Ontario—Grey for instance—lands have been sold to infants and to persons who had no existence whatever, and large tracts have in this way been kept from improvement, and the progress of the country correspondingly retarded. To prevent similar abuses, a law of residence or no credit for the purchase money ought to be insisted on. The annoyance and loss from credit sales are only too painfully known in Ontario. The whole history of "the arranges," gives warning against introducing a like system elsewhere; especially as there will be in the North-West no excuse for it. If every one 21 years of age, can get a homestead of 160 acres for nothing, on certain conditions, he does not need to purchase; and if he choose to do so in the more thickly settled districts, or wishes to have more than his homestead lot, then let him pay cash. If he can't do that, let him do without the land till he can. The necessity of insisting upon cash payment is manifest: for it has been ruled, if we mistake not, that unpatented absentee land cannot be taxed, as the Crown is still the owner; while to leave absentee land untaxed

would be only to encourage a vicious and anti-progressive system of land speculation, of which Canada has already known far more than enough. To intending settlers, these arrangements about the farming lands are of course most important; but it is also, in such a country, right that the question of fuel should be looked into and arranged in an equitable manner, and that the disposal of the timber should be made in such a manner as to encourage capitalists to embark their money, and give them a direct personal interest in preventing the unnecessary waste of wood in a land so extensive, and where the supply is by no means inexhaustible.

Of course, miners are also dealt with. The whole matter is one of the greatest interest and importance, and one which should be discussed and disposed of in the most careful and dispassionate manner, so as to secure, in the highest possible degree, a fair field to all and undue favour to none. Let it not be said that Canadians or their Government did not know how to deal in a liberal, considerate and common-sense way with the all but limitless territories of the North-West, so as to attract a large and intelligent population to them, and make the present solitudes very speedily the abodes of a healthy, happy, prosperous and numerous community. The bunglings in connection with that country during the last three years have been sufficiently numerous and provoking. It will be a great matter if henceforth a different course be followed, and the statesmanship so often boasted of by the "organ" at last put in a positive and unquestionable appearance.

Labour.

Owing to the number of public works now about to be opened in Ontario, and the consequent demand for day laborers, navvies &c., the labor market will, it is probable, be scantily supplied this summer. Fortunately, as agricultural machinery is improving year by year we become more independent and are able to do many operations with more expedition and with less of manual labor than were formerly rendered necessary.

In the present scarcity of men it behoves us particularly to look for really good men. Wages are high, and unfortunately little distinction can be made, owing to paucity in numbers, between good and inferior men. We have always advocated the true economy of paying high wages to really good men, and would not for our own part, begrudge 5 or 6 dollars extra per month to men upon whose ability and fidelity we could place thorough reliance. As an instance we may mention that we had a man this winter whom we believe to have been faithful, but who was a very poor

hand with horses. The consequence is that one of his horses is very bad with grease the effect of want of attention, while we are afraid that the other has had his shoulder strained in the form generally called in Canada a sweeney. Now, although it would hardly be just to accuse the man of having caused the strain, yet we feel sure that it has been done by injudicious driving before saw-logs, and think that the horse in the hands of an experienced teamster would have been sound today. The horse is a valuable one and well worth \$150, but if his lameness should turn out to be a "sweeney" we may do him value by at least \$75; and thus it is when our animals are in the hands of unskillful men, such may very easily add by loss to their employers, a large increase to their actual wage. There are very few farms in Canada, provided with separate houses and upon such farms it is impossible to hire steadily married men. We are advocates of the encouragement of such men, and we can so encourage them only by providing comfortable cottages. A married man is usually steady, and if he be not a sober man, his antecedents are more easily enquired into than single men who come to-day and are gone to-morrow. A man with a wife and family wishes generally to settle down, and has no incentive to be constantly leaving his master in search of change and of new scenes. It has been urged that married men do not like to hire for less than a year, and that many farms cannot support a man all the year round. To this statement we take exception. There are few farms, that cannot find work for a man at all times. Take any farmer who hires his man every April, taking his chance of good or bad, and you will find him hiring odd men in winter to chop, to team and do heavy jobs, at such daily wages as will in the whole winter fully make up the monthly pay of a man by the year. Again, some farmers count the housework of the wife as nothing, and forget that the time taken up in the cooking for, making beds for, and attending to men in the house, might be profitably employed in other work which should bring cash, and what is equally important, comfort to the household.

Farmers, figure up the differences of prices paid to single men when bed and board is supplied, and those paid to married men who board themselves, and you will be astonished how soon that difference will pay for a cottage.

You will have to pay \$15 in summer, and \$12 per month in winter to an able-bodied single man, or an average of \$13½ the year round. I say you pay a married man \$20 per month for the year, (a long price) and give him his cottage free. That makes a difference of \$6.50, and surely you cannot board a man for less than \$10 per month—or in other words \$3.50 per month is saved as rent for a cottage. \$42 per year would be interest of 10 per cent upon a cottage which costs \$420—and we may throw in the

advantages of having a man likely to stay after he gets into your ways, and the advantages of his absence from the farmer's house hold.

Notes on the Weather.

The want of rain combined with other causes, has made the springing of crops and eafing of trees unusually late this season. Last, however, favourable accounts of the appearance of most spring crops. The fall wheat has no doubt suffered considerable damage, and in some places cover was also badly winter killed. As to the probabilities of the present season it is quite too early to speculate; and indeed predictions on such matters can rarely ever be safely hazarded.

The following is the Meteorological Report for the month of May, received from the Toronto Observatory:—

The temperature of May has been slightly above the average of that month, being 51°; it has been however 2° colder than May 1871. The highest reading of the thermometer occurred on the 7th, when it reached 78°. Some of the hourly readings of the thermometer on that day showed a very large excess above the average of the day and hour. At 2 p.m. the excess was 21°, and at 4 p.m. 21°; this temperature seems only to have been temporary, as from 6 a.m. to about 3 p.m. an increase of 37° occurs; from 3 p.m. to 4 a.m. of the 8th, a decrease of 31° is also recorded. The warmest day was the 7th, the mean of which was 62°, and the coldest the 3d, mean 40°. The lowest temperature occurred on the same day, when the thermometer reached the freezing point.

The amount of rain was again far short of the usual May rains. It fell on 14 days, and amounted to 1.1693", in comparison with 3.25, the average rain fall. No snow fell during the month. The total deficiency of rain from 1st June, 1871, to 31st May, 1872, amounts to no less than 12'15 inches, only a trifle less than one half the annual rain fall in the neighbourhood of Lake Ontario.

The amount of cloud was slightly under the average, and the days may be classed as 4 overcast, 18 partially clouded, and 9 clear.

The prevailing winds have been westerly and easterly; on 17 days, the former prevailing and on 14 the latter. The greatest day's winds occurred on the 4th. Average hourly velocity 19 miles from the N. W. on the 25th; 18 miles from the West, and 15 miles from the N. W. on 23th.

We learn, from a private source, says the *Prairie Farmer*, that the great Mikado of Japan, has mastered all the mysteries of American agriculture as taught by Ex-Commissioner Capron—at least, all of them that he desires to master—and that he has paid off the whole delegation and sent them home "rejoicing!" "What can the matter be?"

Horticulture.

EDITOR—D. W. BEADLE.

CORRESPONDING MEMBER OF THE ROYAL HORTICULTURAL SOCIETY, ENGLAND.

A Plea for House Plants.

I beg to call attention to the following facts, culled from an article on the subject which I recently came across:—The opinion frequently expressed concerning the injurious effect of house plants is by no means a new one, nor is it confined to the young. It exists in "older heads," and will prevail, it is to be feared, until the sciences of botany and chemistry are studied in our common schools and by our firesides. From them we may learn many facts, established by experiment, proving that, so far from being injurious, plants are the great promoters of health and supporters of animal life, not merely in furnishing food, but also the breath of life. These sciences abound in interesting facts and experiments, showing how inorganic substances, such as air, water, and some minerals, are transformed into the various vegetable substances used by animals to sustain life and promote growth, and how, in return, animals furnish plants the necessary elements of life and growth. When wood is charred in a pit, a black mass is the result. This is carbon, the solidifying principle of all substances possessing life. When this carbon or charcoal is burned, heat is produced by its union with oxygen. Carbon also exists in the blood of animals, and is the principle of producing animal heat, and of with oxygen in breathing. The result of this union is carbonic acid gas, the impure air thrown from the lungs. This cannot be again taken into the lungs, as expelled, without producing harm. But the revelations of chemistry teach us that this carbonic acid gas is exactly fitted for the use of plants, and even indispensable to their life and growth. Being absorbed by them through the numberless pores on their surfaces, it is decomposed, the carbon going to form the vegetable structure and increase its growth and solidity, while the oxygen, the only life-sustaining principle of the atmosphere for animals, is thrown off, to be again inhaled by the lungs, there again to receive carbon and return, thus passing to and fro, carrying the elements of life from one to the other constantly. The same poisonous gas arises from decaying vegetation; and with another called ammonia, from decaying animal substances. These cause the unhealthfulness of cities where vegetation does not abound. It is the office of the green parts of vegetables to absorb and decompose these gases and water. Hence the immense amount of green surface spread out to catch the aerial aliment. Wherever a green plant exists, whether it be those which man cultivates as sources of

food, or the venerable forest trees, or the wild weeds of the hedgerows, or the humble grass by the wayside, or the seaweeds which grow in the ocean, or the exotic in the parlour;—this is its essential function—that in which vegetable life consists, to absorb carbonic acid gas, decompose it, use the carbon in forming organic vegetable compounds, and restore the oxygen to the air. From these facts we may safely infer that the cultivation of house plants under favourable circumstances, so far from being injurious, is beneficial to health. Those which present the most extended leaf-surfaces are the most useful.

There is also another way in which house plants benefit health—viz., by promoting cheerfulness. Now is the time to secure these sources of joy for the coming season. They will cost less and afford more real amusement than heaps of trifles.—*English Mechanic.*

Dwarf Apple Trees.

To the Editor.

Sir,—Will you kindly answer the following queries:

1 How many branches should a dwarf apple tree have? In a book I have, the right thing is said to be from twelve to fifteen. It appears to me that is too few, but I would like to know what you say on the subject.

2 How many ought a standard to have?

3 And as I am to be planting some vines in the spring, I would like to know how long and how strong the posts ought to be? that is for the trellis?

Perhaps you will think I am bothering you with too many questions. I hope you will excuse me, for I have never seen a right trellis for training vines on yet. I hope answers to those questions will benefit others besides myself, for many read the GLOBE.

J. K., 8th con. Bruce.

REPLY.—The first and second questions may be answered together. There is no precise number of branches which a dwarf apple tree or a standard ought to have. The top or head should be so pruned as to allow the air and light to reach the leaves, and as many branches may be grown on a tree as the cultivator chooses, so long as they are not crowded together too closely. The top of a tree should never be allowed to become a tangled mass of limbs and leaves, nor on the other hand so bared as to expose the large branches to injury for want of the protection which the leaves and smaller branches afford.

Posts that stand five feet above the surface of the ground will be long enough for the usual method of training grape vines upon an upright trellis. Those posts which receive the strain of the wires require to be strong, but the intervening posts whose office is merely to keep the wires at the proper distance apart and to sustain the weight of the vine and fruit, may be quite light.

Influence of Coloured Light on Vegetation.

The following is the result of experiments instituted by M. Bert, the experimenter, to determine the effects of differently coloured lights upon the sensitive plant, *Mimosa*:

The experimenter placed several specimens of the plant under separate bell-glasses, which differed from each other only in the colour of the glass, and all were kept in a warm green-house. At the end of a few hours a difference was already apparent. Those plants subjected to green, yellow, or red light, had the petals erect and leaflets expanded; the blue and the violet, on the other hand, had the petals almost horizontal, and the leaflets hanging down. In a week the plants under black glass were already less sensitive, and in twelve days they were dead or dying. Those under green glass had by this time become entirely insensitve, and in four days more, or after sixteen days of exposure, were also dead. At this time the plants under the other glasses appeared to be perfectly healthy and sensitive, but there was a great inequality of development among them. Those under white glasses made great progress, those under red less, those under yellow a little less still, while those under the violet and blue glasses did not appear to have grown at all. After sixteen days, the vigorous plants from the uncoloured bell-glasses were removed to the green; in eight days they were less sensitive, in two more the sensitiveness had almost entirely disappeared, and in another week they were all dead. Green rays of light appeared to have no greater influence on vegetation than complete absence of light; and M. Bert believes that the sensitive plant exhibits only the same phenomena as all other plants colored green, but to an excessive degree.

Massachusetts Horticultural Society.

From the report of the Committees on Premiums of the Massachusetts Horticultural Society, we find that \$1,528 were awarded on fruits, and \$2,098 were awarded on flowers, at the exhibition of the society last year, making a total of \$3,626 as the whole award made in cash. This is exclusive, however, of silver medals and certificates, of which there were many. This society is one of the most wealthy—if not the wealthiest—in the United States, and among its honorary members are numbered many eminent men, both of this country and Europe.

We are indebted to the Society for a copy of the Transactions for 1871. The officers for 1872 are William C. Stroug, of Brighton, President; Charles O. Whitmore, of Boston, H. Holts Hunniwell, of Wellesley, Francis Parkman, of Boston, P. Brown Hovey, of Cambridge, Vice-Presidents; Edward W. Bushnell, of Boston, Treasurer and Corresponding Secretary; Edwin S. Rand, Jr., of Boston, Recording Secretary; and John L. Russell, Professor of Botany and Vegetable Physiology.

Horticultural Hints.

To the Editor.

PLUM TREES.

SIR,—Records of failure may be useful, but records of success are much more inviting to your rural friends. Perhaps, sir, you are the owner of a plum tree, and have known the feeling of disappointment, when morning after morning you have found half grown plums carpeting the ground. Perhaps you have, on examination, found the stem almost eaten through, or so black and decayed that it could no longer bear the weight; and almost always a minute worm hole in the plum itself. Such was the fate of my plum crop for a number of years, but now it is as certain to ripen into full maturity, as is the crop of the adjoining apple orchard. My remedy is a simple one. When the tree is in full blow, and whilst the dew is still on, I scatter several handfuls of unleached hardwood ashes on the blossoms, repeating it a day or two after. For the last four years this has insured me a most abundant crop. I suppose that it destroys the egg of the insect, who does the mischief, but whatever the theory, the fact will prove of service to your readers. A word of caution is necessary here. Ashes have not proved serviceable in my experience to either apple or peach trees, when applied to the blossoms, though, of course, valuable as fertilizers. This "top dressing" is worthy of much study, and many experiments.—Plaster on "apple blossoms" is very beneficial to that crop, but I am informed that it is death to the "peach."

SHADE TREES.

You had some time since a most serviceable article in the *GLOBE* on this subject, but the writer apparently had not the experience to enable him to do more than make general suggestions. I have planted many trees for ornament and shade, and have been successful in making them live, but you have so often pointed out the best methods both of "taking up" and "setting out," that I might fairly say my success has been from following nature's laws, as pointed out by you. My object now, is simply to speak of the best varieties for shade and ornament. I do not like uniformity. Occasionally an avenue of elms may be very imposing, but to most eyes there is a special charm in variety, especially if there is a tolerable uniformity in the rapidity of growth. To secure this I mulch plentifully with long manure in the spring, and in the fall dig it in, leaving the soil open and loose for the action of the frost. Of all ornamental trees, I give the preference to the "basswood." Its broad leaf, soon makes a young tree, a welcome shade from the hot sun, and its habit of growth makes quite as ornamental a top as "sugar maple." The "whitewood" with its beautiful "tulip" flower, is also hardy, and grows into a handsome shape. All know the value of the "sugar maple," yet where the soil is heavy,

it seems to linger out an unhappy and unhealthy existence. For such soil the "swamp maple" is much better adapted, and has the additional merit of more beautiful tints when touched with the first autumn frosts. I use, and suggest for the use of others, a mingling of the above varieties with the elm, as sure to make beautiful city, town, or rural village. They should be at least 25 feet apart. Were our country roads thus planted, at but trifling expense, it would, I am sure, develop a love of the beautiful, besides proving very attractive to the travel-worn emigrant, seeking a new home.

Other items occur to me, but perhaps the above is a sufficient test of your readers' patience, and the space of your columns.

CHARLES DAWBARN.

Canadian Seed Trade.

To the Editor.

SIR,—Will you kindly publish the following which, I think, has reference to an important branch of Dominion industry :

TO THE SEEDSMEN OF CANADA :—

Gentlemen, a few weeks ago I ventured to remark in one of our newspapers that it seemed to me a pity, as well as a reproach to the seed-growers and nurserymen of Canada, that nearly all our towns and villages are supplied with garden and field seeds, not of Canadian but United States growth. Travel where you will, in this Province at any rate, and such advertisements as "Briggs & Co's Garden Seeds, New York. For Sale Here," will meet you in all our shops. Having lately asked at a country store why it is that we cannot get Canadian seeds, the reply was :— "The Americans bring their seeds around to us early each year in these boxes and with these catalogues and advertisement ; and so to save trouble we take them, for we should have to get Canadian grown seeds by train."

I ventured, therefore, to suggest that our Canadian seed growers should use the same enterprise in the disposal of their seeds ; and to state my humble conviction that it is a matter of great reproach to us to be thus outstripped in enterprise by our southern neighbors. I stated also that from experience I have found Canadian grown seeds most excellent. It seems to me too bad that the skill, perseverance and industry of our seedsmen, &c., should only be rewarded by, comparatively, local custom ; and I should be much pleased to see our Canadian seeds and their advertisements distributed throughout the length and breadth of the land.

In reply to my suggestions, Mr. Wm. D. Webster, of Brantford, Ont., published a letter on the 4th inst., to this effect :—"Your suggestion recommending the growing and vending of seeds and trees in Canada of home growth is a capital idea and worthy of careful consideration. There are, however, difficulties in the way—in small gardens seeds of the same family will intermix—hence imported seeds. Now from your article the idea

has occurred that we might form a 'Seeds Growing Company' in this Dominion ; each member of which to grow but one kind of seed (to be agreed upon) of the same family;" and concludes thus : "I throw out these hints to invite discussion by gardeners. Let us hear your opinion, gentlemen. By the adoption of the above plan, there is a good opening to make money ; to save money to the country ; and to insure to the inhabitants to have good, genuine, true seed, which last is a great consideration. Will gardeners please exert themselves, or use their influence to have this article copied in the papers of their several localities."

Now, sir, though I have not the slightest interest in the proposed enterprise, I willingly take the pains to present this subject through your columns more generally before the public, with the hope that it may be favourably and promptly acted upon.

JAMES MOCKRIDGE, M.A.,

The Parsonage, Norval.

Fruit Growing at Fitzroy Harbour.

To the Editor.

SIR,—It is upwards of twenty years since I made two attempts to raise some fruit by getting apple, pear and plum trees from Montreal. The first lot never recovered the transplanting, only sending out a few shoots about the roots; the last lot grew for a few years and then, with the exception of two or three that held on a few years longer, all died.

I think that it was by layering that I succeeded in keeping two Fameuse and one St. Lawrence till about five years since when they commenced bearing; the St. Lawrence only bore one year, the Fameuse went on until I got about a barrel from one, and they have since been dwindling away, and I fear unless I can get them doctored that I shall lose them.

The prospect of being able to grow a little fruit induced me five years since to get a few trees from the Toronto nurseries. These have been killed every winter to the snow line and are now a mass of brush; (they are said to be dwarf). I don't know what to do with them. Under these circumstances I think there is very little encouragement for me to join the Fruit Growers' Association, unless indeed I can learn something thereby, or from the *Canadian Gardener*, which I shall obtain as soon as I can. The apple trees that I now have are Fameuse and Red Astracan, the pear are Flemish Beauty and Bonchretien, plum the Lombard, and grape are the Concord and Delaware. The Toronto lot have none of them yet fruited.

I presume I shall be the most northern member of the Fruit Growers' Association of Ontario. Our winters are dreadfully long and severe, but not more so than at Montreal, where I have seen excellent apples and pears grown.

W. P. TAYLOR.

Pears.

Mr. Frederick Membery, writing from Bath, Ontario, asks: "What Pear trees would you advise me to plant—Dwarf or Standards? Giving reasons and the best variety of fruit for this section."

REPLY.—Dwarf Pear trees, in that part of the country require some shelter and to have the quince roots, upon which the pear is worked, protected during winter by a mulch or covering of course manure, or leaves, or litter, spread upon the ground over the roots to a depth sufficient to prevent the ground from becoming very severely frozen.

The following varieties of Pear are found by trial to be the most likely to do well, viz: Flemish Beauty, the most hardy out of seventy kinds, Bartlett, Vicar, Louise Bonne, Seckel, Buffam, Belle Lucrative, Howell, Sheldon, Lawrence, Winter Nelis, White Doyenne.

In some exposures the following have been found to be too tender to endure the climate there, viz: Buffam, Belle Lucrative, Tyson, Beurre Bose, Beurre Diel, Duchesse d'Angouleme and Easter Beurre.

A gentleman residing in the county of Prince Edward says that some varieties appear to be tender when young, such as the Bartlett, Beurre Clairgeau, Doyenne du comice, &c., but become more hardy as they acquire age, if grown in suitable soil, well drained, and the trees are not allowed to overbear. He says that several varieties have failed with him entirely, but he is not ready to cast them out without another trial on different soil. In testing a new variety he plants trees of it on different soils, and is convinced that soil and cultivation have something to with the hardihood of a tree.

The Ribston Pippin.

"The original tree was first discovered growing in the garden at Ribston Hall, near Knaresborough, but how, when, or by what means it came there, has not been satisfactorily ascertained. One account states that about the year 1688, some Apple pips were brought from Rouen, and sown at Ribston Hall, near Knaresborough; the trees then produced from them were planted in the park, and one turned out to be the variety in question. The original tree stood till 1810, when it was blown down by a violent gale of wind. It was afterwards supported by stakes in a horizontal position, and continued to produce fruit till it lingered and died in 1835. Since then a young shoot has been produced about 4 inches below the surface of the ground, which, with proper care, may become a tree, and thereby preserve the original of this favourite old dessert Apple. The gardener at Ribston Hall, by whom this Apple was raised, was the father of Lowe, who during the last century was the fruit-tree nurseryman at Hampton Wick.

Grafting the Grape.

The past twenty years I have grafted and propagated many thousands of grape vines in my green-house and in the field; have tried almost every month in the year, and I find April or May the best time, or when the buds are just bursting or pushing; then no sap will trouble or drown out the graft, as is the case when the grafting is done in the fall or early spring, as heretofore recommended. Such grafting will most surely prove a failure. I use no wax; clay is much better; but the scions must be kept back. Grafts below ground, on young thrifty plants. No good grafter would ever think of grafting old snags or old trees that ought to be cut down; and so with old vines that have been neglected and not renewed; they are no better than old snags, and it is time lost to try to improve such self-exhausted and worn-out plants. Nor can grafting be done by every one without some practical experience. No grafter is always successful in grafting the apple or pear, much less in grafting the grape, as it is quite a different process, although quite simple to one who knows how.

Experience in Fruit Raising.

To the Editor.

SIR,—Having been a planter of Fruit Trees in different localities, and at several times; I have taken the liberty to give you my experience in that particular. My first attempt was on my farm at Keisall Lodge, county of Nottingham, England, aspect, N. W. soil, light clay, with strong clay-subsoil. Distance 20 feet by 20 feet, upon slightly raised ridges. The holes 6 feet in diameter, by 4 feet in depth. We then chopped the turf into small pieces, mixing them with equal parts of soil and stable manure; filled the hole to about one foot from the surface; the plant set, every branch of root kept in an horizontal position, and well covered with the best of the soil,—add some more manure, finishing with the strongest soil, which renders shaking unnecessary. The varieties were Apple, Pear, and Plum. Upwards of 900 Plants. Average growth 14 inches. Two plants died. In four years, bearing fruit commenced; and continued to do so; it had an excellent crop of fruit last season, 1871. My next attempt was at our present residence. In October 1868, I selected 365 plants, apples, from the nursery of Mr. Chas. Arnold, Paris, Ont., these were planted April, 1869, 24 feet by 18 feet, aspect N. E. soil, gravelly limestone. Only one died; four of them fruited last (1871) season. In April, 1870, I selected from the stocks of Messrs. Arnold, Paris, and Holton, Hamilton, upwards of 300 plants, including apples, cherries and ornamentals, all of which are healthy and growing. In the spring of 1871, planted 90 peaches supplied from Dr. Beadle's nursery, 35 of which have made good stout healthy wood; and I expect to see bloom

upon some of them this present season. In April, 1870, I grafted an old plum stock, with Smith's Orleans, last season it fruited; I thinned 70 from its branches, leaving 67 to mature; with part of which I obtained the first prize for that variety at the Goderich Show last September.

I have a seedling cherry, ripe from the first to twentieth of August, which is superior to any other in either town or neighbourhood. Also a seedling peach, ripe from Sept. 20th to Oct. 10th, very good. Have had them 10½ inches in girth, and nine ounces in weight.

Specimens of the above I shall feel great pleasure in forwarding to you during the ensuing season.

JOHN MOSELY, Goderich.

[We shall be most happy to receive anything our correspondent may be pleased to send us.]

The Grape Trade in New-York.

THERE is one feature of the grape trade that has developed itself this season, since the closing of the holiday trade, that I think is very important as well as interesting to growers:—that is, that since the holiday trade closed, which has formerly been considered the complete close of the trade, there is a good demand for Catawbas at an advanced price; and had some of the fruit received better care, no doubt it would have sold at better figures. This is a pleasing feature of the trade, for growers will not now be so anxious to force their fruit on the market in large quantities as formerly, and realize low prices. There is one cause for this state of trade that it is well to consider and prepare for it in the future; it is, the quantity of foreign grapes that may be sent here. This season they have arrived in such poor condition that they were not fit for those to make use of who habitually buy them, consequently these parties were compelled to purchase the native fruit.

I have attended the auction sales where this fruit is sold, and seen several lots offered for sale, but they were in such bad order that no one would bid for them over the value of the package.

For the information of those not acquainted with this foreign article, I would say that the grape is white, large and very sweet, containing no pulp like ours, but a solid, meaty substance. These are packed in what is known to the trade as barrels and half-barrels, the first containing fifty pounds, the latter twenty-five pounds. For packing material, ground cork is made use of, it being cheap, and free from all offensive odor.

In regard to the outside demand, as we call it, for our native fruit the past season, I would say that it has increased very materially, and in places where the State fruit has entered into competition with the Western crop, it has taken the lead particularly

at the latter part of the season. Judging from the past season, in my opinion, the Southern States will require fifty per cent. more of Northern grapes next season than they did the last. Last fall I made two shipments of the Isabella and Catawba to Glasgow, Scotland; they arrived in good condition, but owing to their being so unlike any grape they have there, they did not sell well. They refused the Catawba, saying it was not ripe; but the Isabella, being black, was preferred, their grapes being either black or white.—*Rural New-Yorker.*

Laburnum, or Golden Chain.

(*Cytisus Laburnum.*)

This beautiful Alpine tree is no stranger in the gardens of the Eastern States, still

"Laburnum... rich in streaming gold,"

is far too seldom seen, even among collections of less rare and beautiful trees. *Laburnum* seldom grows to a large size, even in its native country (Southern Europe), but the wood is extremely hard and formerly used in place of ebony. The position where it seems to fit in best is among evergreens, where the long pendent racemes of flowers shine out more strongly by way of contrast. If a group of snowball bushes stand near by, the brilliant tints of the golden chain will show even more brilliantly, for these two old favourites bloom nearly at the same time.

Although the *Laburnum* is usually considered quite a hardy tree, and grows in barren, bleak localities in Britain, still it often fails in this country, on account of the dryness of our climate.

To grow it successfully the trees should be given plenty of mulch in summer, the entire surface of the soil for several feet in extent about the roots needs to be covered, especially if grown in a light dry soil. They require moisture, but not a wet soil. The trees are readily propagated by seeds, grafting or budding. There are several varieties, which are usually propagated by budding upon seedlings of the wild Eurocan species.—*Rural New-Yorker.*

Water Cress.

Water Cress is an article in the New York market, the growers of which do well at it on account of its hardness, easy growth, and prices they realize from its sale. It is a small plant which grows in running streams, and when once planted seldom dies out. It is easily grown by damming any small running stream into beds of perhaps six feet width, and as long as the fall of the stream will permit to give from six to twelve inches in depth, this plan of beds can be carried out. If the bottom of the stream is muddy, dig it out, and then fill in with clean sand or gravel just thick enough to keep the

mod from showing. The sand will keep the plant clean and bright, and free from a muddy flavor, which injures the value of it. Each dam should be so arranged as to have an extra board on it to drop down and raise the water sufficient to cover the plant when it is likely to freeze during the night; in the morning it can be drawn off again if it is warm. Should the winter be mild it can be fit to market by February, when it sells for a good price, being much used in oyster saloons and families in places of cabbage. It is easily marketed. When ready to cut, a person can enter the pond with his big top boots on, and with a pair of shears can cut it as easily, and in some measure like shearing sheep, for if the plant should grow thick, it will mat together like a fleece. Then you can either use baskets, or boxes which will hold from eight to twelve quarts to send it to market in. A basket resembling those placed over a horse's nose while plowing corn is a good shape, and having no handles, are easily packed in boxes or barrels. Care should be taken to have it in a measure dry before packing, and the outside package tight to protect it from frost during transportation, for freezing spoils it. There is no sale for it after cabbage arrives in market.—

Am. Rural Home.

Cheap Apparatus for Drying Fruit.

Mr. R. S. Mason, of Dodge Co., Neb., thus writes to the *Grandavenue Telegraph* describing a fruit-dryer, which he pronounces effective and is cheap. It is a subject which interests every one who has fruit to dry:—

Take any common stove, plant it firmly on its feet in some place most convenient, and enclose it with a brick wall leaving out one brick in the back part, for the cold air to enter. When the wall is up to the level of the top of the elbow in the pipe, arrange for a door which may hang on hinges or slide up, down or to either sides, as may suit best; then lay two more courses, and insert at every course after that two three-eighths inch round iron rods in the mortar joints all the way up as high as you wish to go. These rods are to lay from front to back to support the shelves, which are slid in upon them from one side of the oven to the other. Make the shelves of tin nailed to strips for the edge of wood, one and a half inch wide and one inch thick. These shelves must be as wide as the inside of the brick case, but not so long by two inches. The top of the oven may be covered by two inch plank, kept in place by a course or two of brick laid in mortar.

Put the shelves in place so that the hot air may pass under the lower one, then over it, then at the end up and under the next one, leaving the end openings alternately at one end and then at the other open. This will make a draught of hot air which will dry the fruit very quickly in all kinds of

weather. Tin is better than woven wire for the shelves, being more easily cleaned, and by forcing the air in zig-zag course, will require a less intense heat than an ascending current, consequently less danger of burning the fruit. Tomatoes cut in half and the seed core taken out, laid cup side up, dry rapidly, and are much better than when canned. Fruit should be laid on the shelves so as to retain all their juice; sweet corn must be parboiled and then dried quickly, or it will sour. This dryer is fly and dirt proof, does its work perfectly, and where much fruit is raised will pay for itself twice over in a season.

REMEDY FOR BARK LICE ON APPLE TREES.

—A correspondent from Owen Sound wishes to know what remedy could be applied by means of a syringe to destroy the Bark Lice on apple trees.—Dissolve one pound of potash in two gallons of water and syringe them with it. The alkali will kill them.

WINTER-KILLING OF EVERGREENS.—Mr. Meehan in a late number of the *Gardener's Monthly*, says: The past winter has been very trying to vegetation here in the Eastern States. The absolute degree of cold has not been remarkable. There have been winters when the thermometer was much lower, and vegetation less injured than it is now. The hardest evergreens, like Hemlock, Spruce and Balsam Fir, have suffered severely. Scarcely anything in the way of evergreens, indeed, but what has been injured, wherever exposed to wind. There have, however, been no winds of extra severity this winter, but there has been an unusual absence of moisture in the atmosphere, and it is this dry wind that has done the damage.

A TIMELY SUGGESTION.—There are thousands of residences all through the country, which were planted some years ago, and where the rapid growth of shade trees has begun to shade and smother beds of flowers of such sorts as only flourish in sunshine. The inquiry is, therefore, frequently made, "What shall we plant that will succeed and bloom in the shade?" Nothing is better than our wild or native flowers. They are easily removed, if their exact localities are marked by sticks while they are in bloom, and the removal made some weeks afterwards. Those who would avail themselves of the opportunity should now proceed to mark such as appear in bloom. The flowers of some have already disappeared, but the plants may yet be found from the leaves, such as the Hepatica, Claytonia, Erythronium, &c., while many others are in bloom or preparing to flower. It is obvious that any of these ornamental plants which flourish and bloom in the woods, will succeed equally well under dense shade trees in home grounds, and often much better, by keeping for them a clean and mellow soil. Ferns are also exceedingly appropriate for such situations.—*Country Gentleman.*

Entomology.

The Great Pest of the Apple Orchard.

APPLES AND THE CODLING MOTH.

The codling moth, which came to us from the Old World, and the Plum Curculio, a native American, are the two princes among the powers of evil that infest the domain of the pomologist; and between them they divide the empire of the most valuable fruits of temperate climates. The first insect is confined entirely in its propagation to the pomaceous fruits, while the latter breeds almost exclusively in the stone fruits, though doing much damage also to apples and pears by puncturing and defacing them. While our apple crop may be seriously damaged in various localities by other insects, yet these are limited practically to particular districts of country, but the apple worm has become naturalized wherever the apple itself is grown, and in many regions the culture of that fruit has become unprofitable, mainly in consequence of its depredations. Perhaps no insect has been longer known to the entomologists of Europe and of this country, or more often described in agricultural publications, yet until a few years past no progress has been made in practical measures for checking its rapid increase. The beautiful little moth, the parent of the not very appetizing worm that apple eaters so well know, is itself one of the most modest and shy of all insects.—Doing its work in the night, it is rarely seen or recognized by the farmer.*

Perhaps there is nothing more important for the American fruit grower to clearly understand, and none that the interests of the whole people more earnestly require that he should understand, than the habits and means of destruction of this little grayish-brown "moth."

WHEN AND WHERE THE EGGS ARE LAID.

According to Dr. Harris, who wrote for the latitude of Massachusetts, the moths commence their work in the orchard about the middle of June. He says, "During the latter part of June and the month of July these moths fly about apple trees every evening, and lay their eggs on the young fruit.—They do not puncture the apples, but they drop their eggs one by one in the eye or hollow at the blossom end of the fruit, where the skin is most tender.

WHAT THE WORMS DO WHEN HATCHED.

The eggs begin to hatch in a few days after they are laid, and the little apple worms or caterpillars immediately burrow into the apples, making their way gradually into the core. Commonly, only one worm will be found in the same apple, and it is so small at first that its presence can only be detected by the brownish powder it throws out in eating

its way through the eye. In the course of three weeks, or a little more, it comes to its full size, and meanwhile, has burrowed to the core, and through the apple, in various directions. To get rid of the refuse fragments of its food, it gnaws a round hole through the side of the apple, and thrusts them out of the opening. Through this hole, also, it makes its escape after the apple falls to the ground."

Many of the worms leave the apples while hanging on the tree, and seek the shelter of the scales of bark about the trunk, or some artificial shelter provided for the purpose, and there each worm "spins for itself a cocoon or silken case as thin, delicate, and white as tissue paper," where after a time they change to chrysalids, and reach the maturity of the moth state. Mr. Riley says that the worm is 33 days developing in the apple; and that the first brood "change to chrysalids in three days, and issue about two weeks afterward as moths ready to deposit again, though not always in the favorite calyx this time, as I have found the young worm entering the apple from the side." So it appears to take about two months from the time of the first deposit of eggs, for the second generation of moths to appear on the scene. According to Mr. Riley, "the second brood of worms invariably passes the winter in the worm or larval state, either within the apple after it is plucked or within the cocoon. I have had them spin up as early as the latter part of August, and at different dates subsequently till the middle of November, and in every instance they remained in the larval state till the middle of April, when they are all changed to chrysalids within a few days of each other."

HOW TO CATCH AND KILL.

Dr. Warder says that "the moth being nocturnal may be destroyed by burning lamps or fires in the orchard during June when they are first at work;" but Mr. Riley declares his strong conviction that they are not attracted by the light, and that all measures for entrapping the mature insects will be in vain. Dr. Harris suggests no remedy except the destruction of the fallen apples containing worms, by hogs or otherwise. This operation is of the greatest importance, and easily carried out, and these insects have been somewhat held in check by hog pasturing. Mr. Sam. Foster, of Iowa, says:—"I have 24 acres of my orchards seeded to clover, and last year the apples have not one-fourth the worms that they have on other trees." Where circumstances render it inconvenient to use the free labor of the hogs, it is highly important to pick up all fallen apples containing worms and destroy them.

But unquestionably the great remedy for the codling worm is found in trapping the worms, as they escape from the fruit, and seek for some seclusion in which to weave the silken chamber where the mysterious changes of their being are to take place.

More than 30 years ago Mr. Joseph Bur-

relle, of Massachusetts, suggested in *The New England Farmer*, that cloths wound around or laid in the forks of the tree will attract the worms to spin their cocoons therein; and Mr. Downing long since made the same recommendation in connection with the use of hogs in the orchard, and the building of small fires to attract the moths in pleasant summer evenings. Mr. Elliott also makes the same suggestion of "old cloths or tufts of grass laid in the forks of the tree," to entrap the worms. Dr. Trimble, of New Jersey, has made these suggestions practical in the oft-repeated recommendation of hay-bands wound about the trunk of the tree. Not that the hay-bands are better or as good as the cloths, but the doctor tried, and induced others to try, this remedy. The objection to the hay-bands is that the cocoons attach to the bands as well as to the bark which they cover, so that they have to be removed at each examination to secure all the worms, and the bands are troublesome to handle.—The use of cloths is more convenient, and believed to be more attractive to the worms. Experience shows that the cloths are more effectual when placed around the tree than when laid in the forks.

Dr. James Weed, of Iowa, has simplified the cloth trap by using narrow strips of cloth about an inch and a half wide, one end of the strip being tacked to the tree by a small nail, over which the other end fastens by a simple slit in the cloth. These cloths are carefully unloosed, and the worms, in or out of the cocoons, killed with a small knife. The doctor has used this trap successfully for two or three years. He captured over 9,000 worms in his orchard during five daily examinations, the last week of June, in 1870, employing labor that averaged just one day to the thousand worms. Many other gentlemen have reported similar success. Mr. Riley averaged a catch of 50 a week on one tree during the cocoon-spinning season. As each worm represented a ruined apple, and as a thousand apples should fill about two barrels, we can estimate the power for damage possessed by this loathsome little pest.

But I think that the best of all the worm-traps is a simple device adopted by Mr. Weir, of Central Illinois, this last summer for the first time. This trap is formed by simply fastening two shingles, the one directly over the other, in such a way as to leave a small space between the shingles. Into this space the codling worms crawl as a secure hiding place wherein to change into the chrysalis state, and are easily found and destroyed. Thin boards or shingles may be easily tacked together by a nail or screw, and examined by simply turning the upper board or shingle from over the face of the lower, like the frame of a fan. It was tried on a large scale with most triumphant success. Mr. Weir carefully experimented with hay-bands, and shingle traps on contiguous rows of bearing trees bearing a similar amount of crop, and

* A fine engraving of this moth and the worm will be found on page 42 of the Canadian Fruit, Flower and Kitchen Garden.

found the number of worms secreted under the cloth much greater than under the hay, and the number in the shingles considerably exceeding both the others.

The time when either of these traps should be put on the tree is an important matter. It takes about a month to mature the worm in the apple after the laying of the egg, it follows that the traps should be ready within a month of the time when the first moths are known to deposit in the spring, which indicates about the 1st of June in latitude 38 for applying the traps, varying the season as you go North or South. Mr. Riley thinks it best to examine them weekly, or in no case passing over more than two weeks.

But however faithfully we have destroyed the fallen apples, and trapped the worms which crawl out of those on the tree or on the ground, there is still another portion of the brood which remains in the fruit and is harvested with it. These come out at various times while in the barrel or other storage, and spin their cocoons in such retreats as they can find about the package or the store-room. On this point Mr. Riley very forcibly remarks that, "Hundreds of these cocoons may sometimes be found around a single barrel, and it therefore becomes obvious that, no matter how thoroughly the hay-band system had been carried out during the summer, there would yet remain a sufficiency in such situations to abundantly continue the species another year. The necessity of examining all the barrels and other vessels in which apples have been stored becomes at once apparent." These barrels should be burned up or cleansed with scalding water. That each moth is capable of producing 200 or 300 others, only begins to tell the damaging story; for as we have two generations in one summer, we must multiply this number by the whole number of these that belong to the feminine gender, and that live to fulfill their maternal functions; which will give a total number of so many thousand apples to be possibly ruined by the progeny of a single moth as to lead us to incredulity, for we do yet have a great many apples that are not wormy. But it must be remembered that nature interposes many checks to the increase of insect life, such, for instance, as the orchard of apples which were all absolutely destroyed by the worms, where there was no chance for further increase!

It may be incidentally remarked that pears are just as largely affected by this worm as apples. The President of the Iowa Horticultural Society remarked, a few years since, when his attention was called to the worms crawling on his coat, from the pears in his pocket, that he had seen no pear that year that did not contain a worm.—*N. Y. Tribune.*

ENTOMOLOGICAL SPECIMENS may be sent for identification, or for information respecting history and habits, to the Editor of the CANADA FARMER. They should be enclosed in a card board or other box, and carefully packed. The name and address of the sender should accompany the specimens.

The Colorado Potato Beetle.

Our friends, whose lot is cast in the fertile western peninsula of Canada, must now be on the alert with regard to this new but justly dreaded insect pest—the Colorado Potato Beetle. Let them remember that a persevering and combined effort to exterminate the insect during the early part of the season will be infinitely more successful and less laborious than any attempt to reduce the numbers of the creature when it has fully established itself for the summer. While, too, the potato plants are small the presence of the enemy can be more readily detected, and remedies can be applied with far greater facility. A stern fight, an uncompromising and steady warfare is the only hope for the potato grower. Let him then make up his mind to the fact that he must work hard for his potatoes for a year or two, and that if he does so, he may look forward to some relief when the natural enemies of the destroyer have had time enough to overtake in numbers the countless myriads of their prey. This must be a work of time; but still we may reasonably hope that—although we are not likely ever again to be entirely free from the presence of this insect—its numbers will, in a few years, be so much reduced as to render it but a trifling evil.

Last year the insect spread throughout Ontario with far greater rapidity than we anticipated, its progress being much aided, we have no doubt, by vessels on the lakes, and, perhaps, railway trains as well. It is only in this way, indeed, that we can account for the presence of isolated specimens of the creature at such remote points from the western frontier as Peterboro', Belleville, Ottawa, &c. This year then, we who dwell in the central counties of the Province will do well to keep a sharp look-out for the invader, and exterminate the pioneers and advanced guard of his grand army as fast as they make their appearance. It will be well not to permit many days at a time to go by without giving the 'potato patch' a close inspection, otherwise the enemy may become firmly established in his occupation of new territory, and put our crop under heavy requisition before we become well aware of his arrival.

In previous volumes of the CANADA FARMER and the GLOBE we have said so much about the appearance and habits of this insect that we need not repeat any description here. Indeed, what with these publications, the Reports of the Entomological Society, and the Special Report made to the Minister of Agriculture last year by our friends Messrs. Saunders and Reid (which we were glad to see reprinted in an immense number of our exchanges) we fancy that every Canadian ought to have no difficulty in at once recognizing a Colorado Beetle, in either larval or perfect state, wherever he may see one. However, if any of our readers have a

lingering doubt upon the subject let them send us specimens, and we shall be happy to determine the species for them. We should also feel thankful if our friends throughout the country would apprise us, and thereby the people generally, whenever the pest is observed in any new locality.

The natural enemies of the Colorado Beetle are stated by Mr. Reid, in his excellent Report upon the Potato Insects, to which we would refer the reader for full information, (*Report of the Entomological Society for 1871*, page 70), to be twenty-two in number, so far as yet known; of these 12 are tolerably common in Ontario. None of them, however, with the exception of a dipterous parasite (*Lydella Doryphoræ* Riley) feed exclusively upon the Colorado Beetle, but only attack the creature when he comes in their way; consequently they do not diminish the number of the pest to the extent that we might anticipate from their numbers and rapacity. Until then they become very much more numerous than they are at present, we must have recourse to artificial remedies as well. Of these the only two that are practicable and reliable are *hand-picking* and the use of *Paris Green*. Respecting the application of these we may quote Mr. Reid's Report:—

"The many entomologists and agriculturist, who have experimented on this insect, with various poisonous and other substances, in those portions of the United States where it has been so destructive for some year past, concur in recommending the use of *Paris Green*, diluted with flour, ashes, or air-slacked lime, as the best remedy known for destroying the insect, both in its larva and beetle state, without injuring the plant. The results of our experiments and investigations confirm this opinion, and this remedy is, no doubt, a reliable one, provided the *Paris Green* be of good quality. Our experience has also satisfied us that flour is a much better substance to mix with the green than either ashes or lime, as the insects eat it more readily, and, at the same time, it adheres more tenaciously to the surface of the plant, and hence is not so easily washed off by rain. We found good effects from a mixture of one part, by weight, of *Paris Green*, with 10 or 12 parts of flour, dusted lightly on the vines early in the morning, when the dew is on the foliage."

"Where only a small patch is cultivated, the mixture can be readily applied by means of an ordinary flour dredger; but when larger quantities are grown, we would suggest the use of a round tin box, about nine or ten inches in diameter, and four or five inches in depth, with a tightly fitting lid, and with a bottom either perforated with small holes, or covered with fine wire gauze. This should be attached, by means of a hollow handle, to a stick of any convenient length. With such an instrument, which may be obtained at a very trifling cost, a large peice of ground can be gone

over in a short time, and the mixture applied almost as fast as the operator can walk.

"As this mixture is of a poisonous character, ordinary care should be used in handling it, to avoid inhaling much of the dust when applying it, to wash the hands after each application, to keep it out of the reach of the children, and to exclude live stock of all kinds from fields where the poison is used. With these precautions no danger need be apprehended, it does not injure the leaves to any appreciable extent, unless very heavily applied, and cannot possibly affect the potato itself."

"Hand picking has been in Ontario until lately, the chief means employed in lessening the numbers of the beetle, and, where perseveringly followed, has proved very successful, but it needs to be almost daily repeated, and is therefore exceedingly troublesome, and quite impracticable where a large quantity of potatoes are under cultivation. In gardens, however, and small patches a great deal may be done by watching the early growth of the potato vines, and carefully destroying as many as possible of the first beetles that make their appearance, before they get time to pair, and also keeping a keen eye to the deposit of the first eggs. The usual method is to knock the insect off the plant with a piece of shingle into a dish or small pail containing a little water, as they readily fall when struck, both larvæ and beetles may thus be collected in large numbers."

■ In the State of Iowa a horse machine has been employed, which is worked between the rows and, by a revolving reel, knocks off the beetles and larvæ and throws them down between two rollers which effectually crush them. This however, of course leaves the eggs undisturbed."

Ants and their Slaves.

There are two species of ants which are accustomed to make predatory incursions for the purpose of carrying off the larvæ and pupæ of their black brethren,—*Polyergus rufescens* and *Formica sanguinea*. The predatory ants do not leave their nests for these incursions till the male insects are nearly ready to emerge, and then they send out scouts, who run over the adjacent fields in search of a nest of negro-ants; or if these are not to be found, they look out for some other species, such as the miners (*F. cunicularia*), though these latter are very courageous. Huber says of them: "These ants will fight with the most obstinate courage, scarcely yielding an inch. In fact, as soon as their assailants are in sight, myriads of miners rush upon them with great fury, and the nest becomes the scene of a terrific conflict; and though the red ants are larger in size, and usually number more than the miners, they are often beaten off by the latter." But to return. When the

scouts come back to the nest, active preparation is made for the impending expedition, and the warriors who are destined to take part in it are selected. The ants now get so excited that they butt at each other with great violence, and let out their exuberant spirits by cleaning their legs and antennæ, and by general and ceaseless activity. On the following day, about 4 o'clock, the chosen band sallies forth, being preceded by an advanced guard of a dozen ants, who march before the main body for about a yard, and then wheel round and take their place at the rear, their former position being occupied by the front rank of the main body, who fall back in their turn, and are replaced as before. Thus they march until they approach the negro camp, when they separate, each ant pursuing a devious course through the grass, and coming suddenly on the fornicary, which is frequently left unguarded. In general, the black ants make no attempt to defend their progeny, but beat a precipitate retreat from one side of the nest as the plunderers enter the other. Occasionally, however, a fight takes place, in which the negroes are invariably vanquished, being placed at a disadvantage and terror-stricken by the sudden nature of the attack. After the battle the pupæ are transported to the nest of their captors, where, however, they suffer no diminution of happiness, being brought up and employed in the same way as they would have been in their own home. The motive which induces the rufescent ants to make these excursions is their excessive indolence. The negro slaves do all the work, even feeding and carrying about their masters, and not unfrequently obtain such an ascendancy over them as to reverse their respective position. For instance, they will not allow them to go out on their expeditions before the proper time; and if they return without their usual booty, the negroes show their displeasure by attacking them and preventing their entry into the nest. Kny and Spence, in their "Entomology," say that the rufescent ants, in addition to the pupæ, carry off prisoners, whom they ultimately devour. But this is doubtful.—*E. C. LeRoy, in "Science-Gossip."*

Nature, indeed, in whatever direction we turn our eyes, is always economizing and utilizing what would otherwise be uselessly expended, and she cries aloud everywhere to those who know how to interpret her sacred mysteries, that nothing shall go to waste, nothing be lost, nothing be created in vain, whether in the animal or vegetable kingdom; and that even death and decay and corruption shall, by her holy alchemy, be transmuted everywhere, in the most bountiful profusion, into life and health and happiness.—*Th. W. B. Walsh, State Entomologist, of Illinois.*

A valuable report of the Entomological Society of Ontario is appended to the annual report of the commission of agriculture.

Apiary.

What is the Cause of the Great Mortality among the Bees?

It is well understood among beekeepers that the above is the great question just now; and yet, in my humble opinion, none have been able to answer it; neither am I prepared to do so. I purpose, however, to show that the theories put forth as to the disease and the cause will not stand the test of careful examination. I have received many letters asking for papers on the subject, but to one and all, I have replied that I was not prepared to say anything about it, until full reports were received from all the affected districts, both in Canada and the United States. These reports are now before me, and after careful examination I have arrived at the above conclusion—that no one has or can answer the question at present.

That bees have died during the past winter, and this spring up till the present time, throughout the greater part of Canada and the United States, is a fact that nearly every beekeeper can attest. So fearful has been the disease that in some large districts every bee has died, and that too under the most favorable conditions. Large apiaries of seventy-five and a hundred stocks have entirely perished. The like has never before been known. After careful examination of all the reports I am fully convinced that bees have suffered from some epidemic, or fearful disease unknown to apiculturists, which is causing far greater mortality than that so much dreaded disease, "foul brood."

For the last four years there have been complaints of a great mortality among the bees in certain districts in the United States. In Canada too we have noted the same, but not to so great an extent; yet it has been increasing every season, and last season in many sections nine tenths of the bees died. What can be the cause of this great mortality. Mrs. Tupper, a noted bee-keeper of Iowa, says in answer to the question, "that bees have died of too much honey," which she accounts for in this way. The honey harvest was very abundant last fall, and the bees gathering largely, all the breeding cells were filled up; the consequence was, that breeding ceased; hence all the bees that went into winter quarters were old bees which have gradually died, and, before it was time for breeding to commence this spring to any extent, the stock became so depopulated that breeding was not induced, and the stocks perished.

Now, it may have been the case, and doubtless was, in the vicinity where Mrs. Tupper resides, that bees gathered largely late in the fall, but in other localities such was not the case, and still the bees died, hence that cannot be the cause. Another claims that it is the result of introducing

Italian bees; but it so happens that all the hybrid stocks are the last to die, and not only so, but in sections where no Italians have been introduced, the native or common bees have died fearfully. Another writer for the *National Bee Journal* says that the honey gathered in the fall was thin and watery, much of which was not capped over: this soured, and being used for food by the bees, produced the disease; but unfortunately for him, in Canada, especially in this section, there was no thin honey gathered in the fall, and all the honey was capped over, yet nine tenths of the bees are dead, and still dying. Several other writers claim that it is for want of bee bread: that they failed to gather in a supply; yet there is no reason why they should not have gathered just as much bee bread last season as in any other season; for surely last season was not so unlike all other seasons in the past that bees should have failed to gather sufficient bee bread, which they never could have failed to do before; for if they had, the mortality would have been the same as now: but the truth is bees have died with plenty of bee bread and honey. Others, again, argue that the winter has been unusually severe; but we know that it has not been more severe than many winters in the past when there was no such mortality among bees; not only so, but the reports show that bees wintered in good dry cellars have died equally with those wintered on their summer stands. Others, again, say that from some cause the queens ceased breeding early in the season, and consequently stocks became depopulated, until not enough of bees were left to keep up sufficient animal heat. But why has such a case never occurred before? Why have all the queens waited for the fall of 1871 in which to cease laying in a manner they have never have done before? The truth is, however, that stocks have died this spring after the queens were breeding all right, and even after the severe cold weather was past, and with plenty of honey in the hives. In fact, in this section the honey gathered last season was of the best quality, as but little honey was gathered after the white clover harvest was over. The hives were well filled, and in most instances the stocks that perished had an abundance of honey.

With the above facts before me I am satisfied that no one has been able to correctly answer the question, while I am forced to believe that bees have suffered from some plague or terrible disease in a manner similar to epidemics among other animals. I am however inclined to think it has reached its height, and will gradually disappear

J. H. THOMAS.

Brooklin, Ont., June 25th, 1872

Mr. Thyer, of Langport, in Somersetshire, England, reports that his bees swarmed on the 18th of February last. The swarm, it is added, was a remarkable fine one, but the bees made their escape and were not hived.

A GREAT TAKE OF HONEY.—A tree was felled the other day at Sandy Creek, Wagga Wagga, for the purpose of procuring honey, which it was known had been collected there by a rather large swarm of bees. When the tree was cut down there was found in the hollow one of the most astonishing collections of honey ever known, probably, to have been gathered by one swarm of bees. There were several immense layers of comb ten feet in length, and of great density, extending along the inside of the trunk, and almost clothing the hollow of the tree entirely. After it had been carried home (having been wasted considerably by the fall of the tree and the primitive mode in which it was collected) the comb yielded over 200 lbs. of honey of the purest quality.—*McLourne Argus.*

Poetry.

Growing Old.

Ah me! How fast the years go on,
The gray hairs mingle with the brown,
And yet these whitening hairs should be
A chain of silver links to me,
Forced by the gentle hand of love,
To lift my ear-bound heart above!

Sadly I watch the fire burn low,
Which in these dimmed eyes used to glow,
But courage, heart! When falls the night,
Then hidden stars reveal their light!
Shall not my soul, heaven-lit within,
Gleam brightly out, though eyes grow dim?

How fast Time's ruthless fingers trace
The lines and furrows in my face!
Yet, though the world finds written there
Only decay and age and care,
Set in my forehead let me see
God's seal of immortality!

God can take from me all my store,
Yet leave me richer than before!
Trustful, through life his hand I'll take,
And Time's sad changes he will make
My stepping-stones to that blest shore
Where change is gain and time is o'er.

Weariness.

Oh, little feet! that such long years
Must wander on through hopes and fears,
Must ache and bleed beneath your load;
I, nearer to the wayside inn,
Where toil shall cease and rest begin,
Am weary, thinking of your road!

Oh, little hands! that weak or strong
Have still to serve or rule so long,
Have still so long to give or ask,
I, who so much with book and pen
Have toiled among my fellow men,
Am weary, thinking of your task!

Oh, little hearts! that throbb'd and beat
With such impatient, fervent heat,
Such humors and strong passions;
Yet that so long has glow'd and burn'd,
With passions into ashes turn'd
Now covers and conceals its fires.

Oh, little eyes as pure and white,
As crystalline its rays of light
Direct from Heaven, their source divine
Reflected through the mists of years!
Given o'er to sin and dimmed with tears
How hard looks the soul of mine!

—*Largillier.*

Household.

Country Homes.

To the Editor.

SIR,—The subject has been agitated, "which tends most to the true development of the mind, trade or agriculture?" It gives a wide scope, almost too wide for less than a day's discussion, and has two extremes on both sides.

There is a vast difference between the tradesman who works alone, and the trader who travels to exchange merchandise. Of course the latter will excel the former in general information.

Then again, the farmer who lives in an old and well settled county, will be in advance of him who from childhood has lived in so isolated a place as that which is commonly known by the name of "back settlements," where society is scarce, close application to work necessary, and education almost an impossibility. But despite these disadvantages many a talented and noble man has stepped from the depths of the forest into the ranks of those whose names we cherish, and from whose lives we might copy many good lessons. Now, I hold that trade alone does not elevate the mind, and think I can prove it by the contents for the nine hours' movement. Their principal plea was that they had no time to improve the mind; and I argue that agriculture does refine the mind. It may not bring out that keen business tact which characterizes the trader; but is that the true development of the mind?

The works of Nature are superior to those of art, and constant contact with them must develop our nobler and better feelings. A great philosopher once said that a blade of grass confounded him. Country people then have by birthright a ponderous and precious book from which to cull wisdom if they will only investigate.

Take the mechanic who labours from seven in the morning until six in the evening, remove him from outside influences, such as daily papers, a rever-end contact with men, &c., and he will be far better than the farmer in intelligence. On the other hand, give the agriculturist with his work, what the mechanic has in the city, viz: papers, society, church privileges, lectures, &c., and he will make the man whose mind is truly developed. Farming also tends to develop the mind indirectly, for without its produce both our bodies and brains would be very dwarfish. The time is past when countrymen were looked upon as an ignorant and uncultivated class. Many of them now occupy high positions in the Dominion; how they fill them is another question which remains for the voters to decide. Lord Dufferin is a great land holder in Ireland, if I mistake not, and will undoubtedly favour the agricultural interest in this country. But I must leave the

farmers to defend their own position, and attain that exalted sphere I would have them occupy. It is their wives and daughters that more especially claim my attention. Although in obscurity, nevertheless, they do exist. And while the men are making such rapid progress in science and art, making constantly new improvements to develop the mind and lighten labour, ought not the women to achieve something also? The world is progressive, and must be so. We cannot occupy the ground our grandmothers did, if we would wish to. Then instead of keeping as far back as possible, is it not more noble to bring our every power into action? Our influence is acknowledged the world over; then let us look well, that it be for good, and all that life demands of us. There are many noble and self-sacrificing women buried in these country homes. I will not say they are dissatisfied with their lot, but is it to be wondered at, after many years of endless toil they become naturalized to the daily routine of housework, as if it were the one and main object in life, becoming in fact a sort of domestic engine that keeps all the machinery in running order. It is not all of life to live, neither is it all of life to work. To that all will agree. And when the body is weary and worn how can the mind improve as it ought? Then why go blindly on? It is better to step out into clear space, than be dragged along with the slowly moving mass. I expect I am too often comparing country life with city life, for the contrast shows shadows too vividly. A man in the city will work so many hours each day, and if that will not accomplish what he would wish, he puts on more hands instead of hours. And so in the city homes, the work does not drive on, you can take time for recreation, and the children can have their hour without feeling it is stolen from something that will add more to tomorrow's burden.

In order to gain a victory it is often necessary to spy out the enemy's position. That being done, I return to my own grounds; then if a shell does burst, my position will be lighted by the explosion, while the enemy will receive the ball and smoke. Take a farmer worth say 10,000, and how much does he spend in a year? Less than 2 per cent. I think. It would be an event of rare occurrence for him to take a journey to a foreign land even for his health, or his wife and daughters a trip beyond the hills that bound their horizon.

Our country homes with all their faults I love them still. In them we find more honesty, integrity, and virtue than in the city. In the country we stand on our own ground; good character, not dollars, gives us our position in society. Talent may bring wealth, but wealth never brings talent, although it gives us every advantage to improve each power we possess. But all cannot reach the height ambition points to. Dame fortune withholds from many the golden keys which give admittance into her enchanted grounds;

but to compensate for the privation often bestows a noble mind in union with a large and generous heart. When farmers' wives and daughters have reached their proper sphere, if country homes are not the happiest, loveliest, and most attractive of all homes, it will be the farmers' own fault; and until this point is gained, young people will seek the city to be ruined by its temptations.

A word to the wise is sufficient; I hope farmers will take the hint and begin to brighten up their dull homes, and enlarge its boundaries if necessary, so as to give their wives more moving space.

VINA BELL

Filters and Filtering.

Water, wine, spirits, jelly, syrup, tinctures, and a great variety of other fluids, hot and cold, often contain substances which should be separated, in order to render the fluid clear and bright. As regards water filtering it has become pretty general; but in domestic life there are fluids, such as wine, liquid jelly, syrup, etc., which are required to be made "clear" before they are put on the table. There are three kinds of filters; sponge for watery liquids, cotton for spirituous fluids, and wool for gelatinous fluids and oils. In every well appointed kitchen, there are tin or porcelain funnels. For filtering watery fluids it is only necessary to insert, in the choke of the funnel, a V-shaped piece of fine sponge. All such liquids, on being put into the funnel, will pass through the sponge and become quite clear. When this effect ceases the sponge must be removed and well cleaned. Vinous fluids are best cleared by filtering through a cone of white blotting paper, shaped by folding a square piece of the paper from corner to corner, then folding the triangle into half its size, and opening the folds: it will fit any funnel, which will act as a support to the paper.

Wines, etc., poured into this, will run through perfectly bright. In some cases where the wine is only a little thick from lees, cork or other mechanically suspended substance, it can be made quite clear by filtering through a wad of white cotton put in the choke of the funnel; and when this answers, it is much quicker than the paper filter. For jelly and oil, wool alone is the proper medium for filtering. The felted wool jelly bag is pretty well known as the best means of clearing calves' foot jelly, and it also answers for olive and other oil. These bags are, however, too expensive to be generally used; hence they are rarely seen in kitchens. A good substitute for the wool bag is a collar, on the inside of which a new flannel lining should be fitted, made of double stuff. A wad of white knitting wool, put in the choke of a funnel will do to filter any small portion of such fluids. Many a good glass of port wine has been wasted for the want of a penny paper filter.—*Scientific American*.

Dishing Out Boiled Potatoes.

If there is one thing harder than another in preparing potatoes for the table, it is taking a boiling hot kettle (covered or not) from the fire, and pouring the water out slowly, which cannot be accomplished without nearly or quite scalding the hand which holds the kettle; consequently the open air is usually better than in a close, dark corner of the kitchen; and it is well-known that every house is not provided with a drain.

Imagine this process occupying at least four minutes in the cold or stifled air, steam rising and enveloping the whole form. One or two holders is requisite; then oftentimes the kettle, which is not of the best iron, is covered, replaced on the stove to stand from fifteen to thirty minutes until the potatoes are saturated with rust or a taste of iron, and all in the bottom watery, having soaked up what it is impossible to turn off, or burned or blackened, making it necessary to throw one-third of them away.

To do away with all these objections have a long handle skimmer (which costs ten cents,) and while the water is slopping place it on one side under all the potatoes it will hold at once, and so on, until all are removed into a convenient dish. The heat retained in the potatoes will make them perfectly dry and mealy while the steam is escaping. They should be eaten before they are done smoking.

To mash or jam them, skim out as we have shown into a tin-pan; place the pan on a flat surface; then mash (not pound,) which will not hurt the pan or the potatoes, season and stir with a spoon.

The kettle is easily removed to cool, or with one stroke the boiling water may be turned into the slop pail. Try it.—*American Rural Home*.

Family Worship.

There ought to be no sweeter hour in the day than that in which comes the morning meal and family worship. Yet it is sorrowful to see what sometimes passes for the latter. A chapter of the Bible hurried through, a rambling, stereotyped prayer mumbled over, and the participants rush off to the work which they have been thinking about, and which they enjoy a great deal better. The exercise is wrapped in fog, instead of being crowned with heaven's light.

It is a mistake to suppose that fluency or education are specially needed in conducting family worship. It wants a heart most of all. Let there not be a single petition that is not born of real desire—even if the prayer be not two minutes long. Blessed be the home where the spirit of song dwells and adds its charm to the morning worship. The exercise need not be long, but it should not be crowded. Break up the formality; carry all the soul life you have into it; and its savor shall not go through the day alone, but among all the home memories, none shall be stranger to hold the grown-up children to the faith of their fathers.—*Christian Work*.

Ironing Clothes.

When starched clothes stick to the flat iron, it is exceedingly annoying, and the house-keeper is rather apt to get vexed and discouraged. Many think it is owing to the manner in which the starch is made; but that is not always the reason. One cause of starch sticking is owing to the adulterations in starch itself. So it is very essential to try and procure the best article. Starch gloss is used to prevent this sticking in lieu of adding a polish.

Some laundresses shave hard soap and boil it up with the starch. An excellent way to make clothes stiff is to starch them when wringing out of the rinse water, then dry them on the line, and when about to be ironed dampen them in water in which raw starch has been dissolved. Spread them between dry cloths and roll them up tight for a quarter of an hour, when they will iron very smooth.

Another consideration is to take good care of the irons. Many housekeepers who are called neat will let them stand on the stove for days, catching all the slops of cooking.—When not in use they should be kept in a dry place. Once the face is rusted, they never look as well again. But in case of their becoming rusted, rub them on emery or brown paper. Beeswax is good to use, rubbing it well over the hot face of the iron, and then rubbing the iron on a cloth or paper.—*Household.*

To Make Glossy Shirts.

Put a little common white wax in your starch, say two ounces to the pound: then if you use any thin patent starch, be sure you use it warm, otherwise it will get cold and gritty, and spot your linen, giving it the appearance of being stained with grease. It is different with collar starch—it can be used quite cold; however, of that anon. Now, then, about polishing shirts; starch the fronts and wrists as stiff as you can. Always starch twice—this is starch and dry; then starch again. Iron your shirt in the usual way, making the linen nice and firm; but without any attempt at a good finish; don't lift the plaits; your shirt is now ready for polishing, but you ought to have a board the same size as a common shirtboard made of hard wood and covered with only one ply of plain cotton cloth. Put this board into the breast of your shirt, damp the front very lightly with a wet sponge, then take a polishing iron which is flat and beveled a little at one end—polish gently with the bevelled part, taking care not to drive the linen up into wave-like blisters; of course this requires a little practice, but if you are careful and persevere, in a short time you will be able to give that enamel-like finish which seems to be so much wanted.—*America to Lord Home.*

Toys as Teachers.

While carefully avoiding the mistake of making play a lesson, some few toys, if well selected, may impart a vast amount of instruction, and that without the child having to undergo any undue mental strain. It would of course, be undesirable to give a little boy five or six years old a direct lesson on the principles of the bridge and the use of the keystone. Give him, however, a box of bricks capable of making a bridge with the centering, and show him how to put it together; he will puzzle over it for days, try every sort of arrangement, and unwittingly become gradually and practically acquainted with some important mechanical laws. Again, a little model of a steam-engine made to work by gas or spirit, which may be bought for a dollar or two, is a most attractive toy. Children will watch it for hours. They see the water poured in; they remark that it is made to boil, and soon has to be replenished, they notice the action of the valves, the piston, the crank and all the parts. When they come to study the theoretical laws of steam and machines, half the difficulty of their first lessons vanishes. If during his play, the child is so fortunate as to have a really educated nurse or mother, herself acquainted with the outlines of such a general knowledge, the child's play may be made, by simple toys, far more educational and interesting than any set lesson, and the result of the instruction far more fixed on his mind than the simplest theoretical idea could ever be by any number of repetitions and learnings by heart.

What is true concerning the box of bricks and the model engine is also true of a number of other toys; that is, they depend for their action on certain laws, with which, by a little skill, children may be made practically familiar without any undue taxing of their minds, and during the time they are engaged in play. Of these may be mentioned, the kite, magnetic fish; hydrostatic toys, with water-wells, fountains, etc.; pneumatic toys, such as pop-guns, etc.; tops of all sorts, the kaleido cope, the magic wheel, etc. All these involve scientific laws which a child may understand familiarly with no more difficulty, if properly put before him, than he usually finds in learning to read.—*Good Health.*

Farmers' Wives and Daughters.

To the Editor.

Sir,—Having been very much interested in reading the letters that have appeared in your Journal on the subject of farmers' wives, I thought perhaps, you would find space for a few remarks from me. I was not quite satisfied with "Vina Bell's" letter, published some time ago for it did not represent country life in its true light, at least not as it appears in the prosperous part of the country in which I live, for farmers in this vicinity are

just beginning to find out that they are the most independent class of people in the world; and when they look around, at the numerous bankrupt merchants and half starved lawyers and doctors that throng our villages and cities, feel happy and contented, that their lives, if not so gay and brilliant as some others, are more independent; for all classes are dependent on the farmers at last, and if their crops fail, all are more or less affected by it.

I know that farmers are too often looked upon, by certain classes, with great compassion, as industrious hard working people, who have no pleasure at all. But this is a great mistake; for I think one can find sufficient enjoyment, with a nice circle of friends, plenty of books, music, and an occasional drive, and of course farmers' daughters need not want for the latter. I am a farmer's daughter myself, and know how to work too, nor do I think it a disgrace to own it either, as I believe some city ladies of my acquaintance do, but consider it rather one of the most necessary of female accomplishments. Of course, I would not like to be obliged to work all the time, still I think any young lady's education, is far from being complete, until she becomes thoroughly acquainted, with all the mysteries of the culinary department. Much has also been said, on the subject of farmers' wives and daughters dress, just as if it was not quite as necessary for them to dress becomingly and with some regard to prevailing modes, as it is for their city friends. I think, however, there is altogether too much importance attached to dress by all classes, and not enough to true worth. I am well aware that farmers have hitherto paid too little attention to educating their children, that is, at the highest schools, (for of course farmers' children usually have a good common education), but I am happy to say they are rapidly improving in this respect, and I trust will continue to improve every year; and I firmly believe the day is not far distant, when the farmers of Canada will recognize no superiors in the land, either socially, or morally, or intellectually.

MAUD MELVILLE.

How to Mix Mustard.—Mustard should be mixed with water that has been boiled and allowed to cool; hot water destroys its essential properties, and raw cold water might cause it to ferment. Put the mustard in a cup, with a small pinch of salt, and mix with it very gradually sufficient boiled water to make it drop from the spoon without being watery. Stir and mix well and rub the lumps well down with the back of a spoon, as mustard properly mixed should be perfectly free from these. The mustard pot should not be more than half full, or rather less, if it will not be used for a day or two, as the mustard is so much better when fresh made.

The "Why" in Vegetable Cookery.

Why should Soda be boiled with greens, cabbage, broccoli and turnip greens?—Because the oil which all these vegetables contain more or less the soda extracts, and leaves the greens sweet and wholesome; but the water is, after boiling the greens with soda, must unwholesome, perhaps poisonous. A piece of soda, filbert size, is sufficient for a very large saucepan of boiling water. Turnip greens have scarcely any oil in them, but are nevertheless much more wholesome for eating when cooked with a little soda. From the seed of cabbage the colza-oil is manufactured.

Why should Vegetables be washed in rather warm water first, then in cold, to cleanse them from sand and insects?—The hot water, which must be hotter than tepid, causes the insects and sand to fall out at once. Insects do not always dislike cold water and salt, but the hot water kills them. It must be understood that only a small handful of greens or one head of cabbage at a time must be washed, and then instantly thrown into the cold water, which crisps and thoroughly cleanses them. Spinach, leeks, celery and sea-kale, are thus rendered very clean, and, moreover, are very rapidly cleansed. It is worse than useless to attempt to cleanse vegetables in salt and water. The hardness which salt creates in the water prevents all cleansing properties. The salt may kill the insects (it does not always do this,) but they stick on hard and fast, and the hot water makes them fall out at once, and the cold water crisps and also blanches them.

Why should Turnips be cut across the fibre in rings of less than half an inch in thickness? For three reasons: first, the turnip need only be peeled very thin, instead of in the usual manner, thickly and wastefully; secondly, by so cutting them the fibres are cut across, so that however old the turnip is, it is never stringy; thirdly, they require only fourteen minutes to boil in plenty of boiling water and salt, and thus the delicate flavor of the turnip is preserved, also they can be more easily mashed. The thinner the circles of turnip are cut, the quicker they cook and the less fibre they will have.—*Mrs. Weston, in The Society of Literature.*

Protection against Moth

We have every spring many a sad offering of protecting furs and woollens against the destructive attacks of the moth during winter weather. We have seen various preparations sold for this purpose, with long accounts depended of their being perfect remedies. But cedar chests and closets are recommended and many people cumber their houses with them at considerable expense, only to find out how previously they have been disappointed.

The best protection we ever tried has been to tie up in close cotton-bags all furs and woollens at all convenient to be so treated, after giving them a thorough baking and cleansing, and letting them there until they

are again wanted. These bags can be hung anywhere out of the way. If there are no moths in the articles when tied up there certainly can none get in afterward if the bags are sound. All can see that. But when the clothes or articles are too numerous to make this convenient or desirable, hang up in the wardrobe, after a good shaking, and place little bags of camphor all over the wardrobe, laying a few in the bottom. Then, about every three weeks take out the clothes and shake them up well. No moth will ever disturb them.—*German town Telegraph.*

Light Air, and Water.

There is no use in having convenient windows, if they are kept closed. It is no use having large sheets of glass if they are allowed to become so dirty that the light cannot come through them. If a house is to be kept healthy, every room in it should have the windows opened daily, and allowed to remain open long enough for the atmosphere to be thoroughly changed. In nurseries, school rooms, workshops, or other apartments which are in constant use, the windows should be thrown open whenever the occupants are absent. Even if the weather is wet and stormy, a few inches at the top should be opened, for a little damp is better than an atmosphere which has been breathed over and over again. In nurseries special care should be taken to keep the windows clean, for young children, like young plants, require plenty of sunshine; and for the same reason the rooms occupied by them ought, if possible, to face the south. What we have already said as to the ventilation of living rooms applies with still greater force to sleeping apartments. In sitting rooms or workshops the door is from time to time opened, so that a slight amount of change of air is secured; but a bed-room door is not opened for many consecutive hours, and it is therefore most important that air should be admitted to it by some other means, for it is an unhealthy thing for the same atmosphere to be breathed and breathed over again. Where there is a fire-place in the room ventilation may be secured by leaving the chimney unobscured. On no account, therefore, should the "register" of the grate in a bed-room be allowed to be shut. But where there is no grate, either a grate should be introduced in the wall, or a small portion of the window should be left open at the top. This precaution might be thought to be attended to when the door is shut, but the atmosphere second-hand is admitted to the room. Another important means of keeping a house healthy is frequently to colour and whitewash the walls and ceilings. This not only adds brightness and cheerfulness to a dwelling, but cleanses the walls, and serves to remove anything which might engender infection. In fact, cleanliness in every-thing is one of the main securities against disease. It is not enough that it should be the rule of the house, it

must also be the rule of individual conduct. Fortunately such an observation as this is less needed now-a-days than it was formerly. The bath has become such an institution that it is probably only among the humblest ranks of society that it would be necessary to urge a daily thorough ablution. For those who have the means of using a large sponging bath, nothing can be more conducive to health; but it is not all who have this at their command; even the poorest, however, who can afford a large basin, a piece of common soap, and a towel, have the requisites to enable them to wash thoroughly from head to foot, which is all that really is essential for health.—*Golden Hours.*

SALAD—*Dr. Kitchiner's receipt for making a salad:*—Boil a couple of eggs for 12 minutes, and put them in a basin of cold water for a few minutes. The yolks must be quite cold and hard, or they will not incorporate with the ingredients. Rub them through a sieve with a wooden spoon, and mix them with a tablespoonful of cream; then add two tablespoonfuls of oil. When these are well mixed, add by degrees a teaspoonful of salt and powdered lump sugar, and the same of made mustard; when these are smoothly united, add very gradually 3 tablespoonfuls of vinegar; rub it with the other ingredients till thoroughly incorporated with them; cut up the white of the egg, and garnish the top of the salad with it. Let the sauce remain at the bottom of the bowl, and do not stir up the salad until it is to be eaten. If to the above be added a teaspoonful of Tarragon vinegar and a teaspoonful of Eschalot vinegar, a salad will be made to which none will object.

New Mode of Washing.—The ill effects of soda on linen have given rise to a new method of washing, which has been extensively adopted in Germany, and introduced into Belgium. The operation consists in dissolving two pounds of soap in about three gallons of water as hot as the hand can bear, and adding to this one tablespoonful of turpentine and three of liquid ammonia; the mixture must then be well stirred, and the linen steeped in it for two or three hours, taking care to cover up the vessel containing them as nearly hermetically as possible. The clothes are afterward washed out and rinsed in the usual way. The soap and water may be reheated, and used a second time, but in that case half a tablespoonful of turpentine and a tablespoonful of ammonia must be added.—The process is said to cause a great economy of time, labor, and fuel. The linen scarcely suffers at all, as there is little necessity for rubbing, and its cleanliness and color are perfect. The ammonia and turpentine, although their detersive action is great, have no injurious effect upon the linen; and while the former evaporates immediately, the smell of the latter is said to disappear entirely during the drying of the clothes.—*Western Rural.*

Agricultural Intelligence.

Hamilton Township Farmers' Club.

DISCUSSION ON ROOT CROPS.

At a meeting of the Township of Hamilton Farmer's Club, held at Cobourg on the 13th of April, 1872. Peter Sidey Esq., President, in the chair. Mr. John Pratt introduced the subject for discussion. "The cultivation of Turnips, Carrots, and Mangold Wurtzels," with the following remarks:—

"Land that is intended for root crops, should be either wheat or oat stubble, ploughed deeply in the fall; ploughed again in the spring, as soon as the land is dry, and harrowed, and cultivated, and rolled, so as to make the land as fine as possible; then plough again immediately before sowing; then drill up the land into drills, 30 inches wide, and draw on manure at the rate of about 30 cart loads to the acre, laying the manure down in heaps in every third drill; spreading the manure evenly in the bottom of the drills.—(I prefer to manure in the drill, as it leaves the manure directly under the roots of the turnips.) Then take the drill plough and run it in every other drill, so as to half cover them; then take about 300 lbs. of salt, and 200 lbs. of plaster to the acre, mixed, and put in on the top of the dung by hand, then run the drill plough up every other drill—those drills omitted before—thus covering all up. I sow turnips from the 14th to the 20th of June. In sowing, take a seed drill and fasten it behind a light roller, sowing one drill up and another down, moving the drill from one side to the other at each turning, so as always to roll the drill you are sowing, and the one you have last sown, sow about three pounds of seed to the acre. Turnips should be thinned as soon as possible, so as to keep the weeds down. A one horse cultivator should be run between the drills before thinning. They should be left about ten inches apart in the drill. In taking turnips up in the fall, I prefer to pull them by hand, pulling with one hand, and topping and tailing with the other, throwing four drills into a row, so as to leave plenty of room to drive a cart or waggon between the rows.

"In the cultivation of Mangold Wurtzels, I would not advise any person to try to grow them on very light land, unless they had an unlimited quantity of the very best manure. What has been said about the cultivation of turnips, will apply very much to mangolds also, except, that you are surer of a crop, if they are sown by hand, in small holes, about three quarters of an inch deep, and a foot apart, and covered lightly. Mangolds should be sown about the 24th of May.

"Land intended for carrots should be treated much in the same way as for turnips or mangolds, except, that it should be manured in the fall. A good plan to add to the length

of the carrot, is to drill up the ground, then subsoil in the bottom of every drill, then split the drills, covering up the part that is subsoiled—which will allow the carrots to go deeper in the ground. In conclusion I would say, that in the cultivation of roots more care and labour is required, than in the cultivation of our other crops; but when we see the improved state of our land after them, the increased amount of feed for our stock, and the more valuable manure in consequence of feeding roots, I think we shall be amply repaid for all our care and labour, and I don't think any man can be a successful farmer unless he grows a large root crop."

Mr. Carruthers, though he approved of much that Mr. Pratt had said, did not approve of putting the manure in the drills for turnips. If the manure was put on the land, and well mixed with the soil he thought it did better; it did not dry up the ground so much, and the young turnip plants stood the summer drought better. In taking up turnips he preferred to cut the tops off, and leave the roots on, so that they might not bleed so much, and take away part of their nutriment.

Mr. Aitchison observed that the plan recommended by Mr. Pratt was just the old system they had in Scotland. However well that system might answer there, he did not know whether it was so suitable for us—our droughts were so severe. He thought green-sod, manured and ploughed in the fall and then wrought up to a fine tilth in the spring did better for turnips here, it left the ground richer, more open and retentive of moisture. He did not know whether it was best to sow turnips on raised drills, or on the flat—some land did best the one way and some the other; he made his drill 28 inches wide for turnips, and 18 inches wide for carrots—he thought that was quite wide enough—he never grew mangold wurtzels. In thinning turnips he would leave the plants about a foot apart, and carrots about 4 inches apart, he knew no better way of keeping them clean, than horse-hoeing them, as often as they needed it, he used about the same amount of salt and plaster as Mr. Pratt recommended. His sowing time was regulated by the state of the weather—he did not care for sowing very early, but if a rain came he sowed immediately after it. He liked a seed drill that sowed two drills at a time; he thought they did better than those that sowed only one drill at a time. He thought Mr. Pratt used one half too much seed.

Mr. Bellerby said that he had never grown a great quantity of roots; he grew turnips every year, but not often mangolds or carrots. he had mostly been accustomed to rather light loamy land, he found that turnips were easier grown, and stood the drought much better on that, than they did on the clay soil. He had seen some of his neighbours, on the same field, manure part of their turnip land in the fall, and the other

part they manured in the drill before sowing; those that were manured in the drill were greatly ahead of those manured in the fall. He always found the fly worse to contend with than the drought. When sowing turnips he used a barrow drill, and rolled down the drills before sowing, but not after, so that the seed was left in a little furrow on the top of the drill; when left thus the fly did not hurt them so much. Turnips manured in the drill might be a little more exposed to the drought, but they did better. He did not like his turnips to grow too rank, early in the season, as they were always the best turnips, and kept best, that got their growth in the fall. In harvesting turnips he took a hoe and cut off the tops, then taking the corner of his hoe and pulling them up, putting three or four rows together, as most convenient. On loamy land this method answered very well. When drawing in his turnips, he made a screen and ran them into root-house over it, so as to take as much of the earth from among them as possible. After he had them all drawn in, he took and threw back 5 or 6 waggon-loads from the place they run in at, as he found if he did not do this they were apt to heat and become useless.

Mr. Young said that he had very little experience with turnips, as he could very seldom get them to grow. In our clay soil he thought it did best to manure the land in the fall, as the drought did not affect them so much as it did when they were manured in the drill, just before sowing. He did not like the hoe for taking up turnips, but preferred the *hard* old-fashioned method of pulling them up by hand.

When planting mangolds, he soaked the seed 12 hours before planting, as they then grew quicker, and better. He made his drills about 30 inches wide, and planted the seeds by hand, about a foot apart in the drill—he liked this plan better than sowing them with a drill, they took more time to plant, but then they took less time to hoe, as you knew exactly where to find your plants; he horse-hoed them first, and then hoed them on the top of the drill by hand; when large enough he thinned them out, leaving always the strongest plants—he kept them clean by horse-hoeing them occasionally. In taking them up he cut the tops and roots of the globe mangolds, just the same as turnips, but the long mangolds he left the roots on. Mangolds ought to be taken up a little earlier in the fall than turnips, as they made their growth earlier in the season, and were more easily hurt by frost. They ought to be kept in a dark place—they kept very well.

Mr. Cook said, he used to raise carrots some time ago, but now he only grew turnips. In raising carrots, he manured and ploughed the land in the fall, and then wrought it up fine in the spring before sowing. He preferred putting the manure in the drills for turnips on any soil; he liked his drills made

pretty wide for turnips, say 2 feet 9 inches or so, that there might be plenty of room for weeds and dirt to lie when scuffling them; he liked to let his turnips be so large before he thinned them, that the fly could not hurt them; he would keep scuffling them occasionally, then thin them out as wide as they should be at once, as, if left too thick at first, they could not be properly thinned afterwards. In taking up his turnips he cut off the tops first, and then put on his harrows, and harrowed them up, and drew them in—he found this far the speediest method, and he thought the roots just as good for feed as any other part of the turnip. As some earth would go in with the turnips, he fed out first from the place they were thrown in at, so as to prevent damage from heating. He liked sowing his turnips with a drill that sowed two drills at once.

Mr. Sibley, President, said that the subject had been now so fully discussed that little was left for him to say on the matter. They were all pretty well agreed on the general principles of root growing; though he might differ from some of them, in some of the details. In light soils it was useless to try and raise mangolds, he found it did not pay him to raise them; if raised at all, they should be raised on strong heavy land, as such soils were rather uncertain for turnips, as for carrots he had given up raising them. Turnips were his favourite root crop; he thought them the easiest grown, the most nutritious, and best for all kinds of stock; even for horses, he thought them just as good as carrots, when once they were taught to eat them. For turnips he mostly manured and ploughed his land in the fall, then ploughed in the spring, and then ploughed again and rolled the land; he then sowed salt on the ground and drilled it up, and sowed his turnips. Last year on the same soil, in the same field, he sowed part of his turnips manured in the drill, and part he put on the manure in the spring; the manure was well rotted, ploughed it in, and drilled up afterwards. On the land thus manured his turnip crop was much better than on the part manured in the drill. In taking up turnips, he preferred taking them up by hand, cutting off the tops and roots, and getting them in as dry and clean as possible. One year in taking them up he left the roots on, that season they heated and he lost some of them.

The English Royal Agricultural College.

The London *Field* has a letter describing the present condition of the Royal Agricultural College at Cirencester, from which our American contemporary, the *Country Gentleman* gives the following particulars:

Founded in 1845, the original charge for instruction, board, &c., was only £50 a year, at which rate the institution could not be sustained and lost heavily. The charge is now

£150 per year; and the farm, which had previously been a source of expense, since 1865 has been let to a tenant, reserving such privileges to the professors and students as were desirable to promote the object of instruction. The present tenant, Mr. Russell Swanwick, whose name is favorably known to American readers, is himself a former student, and under his management the results are satisfactory and profitable. "Not only are the students taken on the farm by the agricultural professor, Mr. Wrightson, but they are required to do practical work on the farm, and thus begin at the root of the matter, and qualify themselves for mastership by learning how work ought to be done. This is a recent innovation, as practical work was formerly voluntary." The farm is about 500 acres in extent, not remarkable, we believe, for richness of soil, but capable of giving a good return with careful treatment. At the first letting of the farm, a plot of 20 acres was retained for experimental purposes, but this being found altogether too limited an area to obtain satisfactory results, an arrangement has lately been effected, by which the whole farm is open for the purpose, and any crop or field may be selected for the use of the agricultural professor.

The course of instruction lasts two years, embracing chemistry, inorganic, organic, and agricultural; botany and geology in their relations to agriculture; veterinary science; surveying, levelling, drawing; and, for those who desire, shoeing, carpentry, and butchering. Special inducements are given to attend to the work on the farm, not only in the offer of prizes for accounts and journals, but in a severe examination for the diploma, conducted on the farm itself by some agricultural authority called in for the purpose. No student has a chance of obtaining the diploma, which is the college certificate of efficiency, unless he exhibits a satisfactory knowledge of practical matters, and of the work that has taken place on the farm. The stock on the farm, especially the Cotswold sheep and Berkshire pigs are represented as being well bred and in fine order.

THE SWINE-BREEDERS CONVENTION.—In compliance with a call extensively published, several gentlemen from various sections of the country, all specially interested in the improvement of the different breeds of swine, met at Cooper Institute, New York, Tuesday afternoon, May 11. Mr. Henry Stewart, one of the editors of *The American Agriculturist*, was made Chairman, and Mr. Chas. D. Drayton of *Moore's Rural*, Secretary. Col. Frank D. Curtis, a prime mover in the enterprise, re-stated briefly the origin and objects of the Convention, and he expressed it as his opinion, shared by his fellow-committee-men, that nothing more should be done on this occasion than to organize, appoint certain committees, and adjourn to some more central point for future consultation. He had, he said, received a great number of

letters from prominent breeders of thoroughbred swine, some of whom made a similar suggestion.

Col. Curtis moved that a committee of five, including the Chairman and Secretary, be appointed to select separate committees of three for each breed of swine bred in America, to report at an adjourned meeting of this Convention upon "their history, characteristics, and a scale of points;" also a committee of three, to report at the same time, on the question, "What constitutes thoroughbred swine?" The Chair announced as such committee on committees, Messrs. Curtis, Chase, and Weld.

It was moved that this committee of five also be empowered to consult with breeders generally, and to call another Convention in November, at such point as may seem most agreeable to the majority of those interested.

The Woollen Manufacture.

It is probable that the fleece of the sheep afforded the first material of human clothing, and that in this pastoral country it has been manufactured from the earliest dawn of civilization. It is on record that the Romans had weaving establishments of woollen cloth at Winchester; that the mother of Alfred the Great was skilled in the spinning of wool; that Flemish woollen weavers settled in England in the time of William the Conqueror; that fresh immigrations of weavers from Flanders took place in the reigns of Henry I., Henry III., Edward I., and Edward III.; that the last-named King especially encouraged the settlement of these artificers in various parts of the country, and that in this policy he was followed by Henry VII.; and that at the Reformation many thousands of woollen weavers flying from the persecution of the Duke of Alba in the low countries found refuge in England. It is certain that the manufacture of woollen and worsted goods in Flanders and of woollens in Italy was carried to a high degree of perfection long before the art had made any considerable advancement in England. There are also many accounts of the exportation of English wool to those countries from very early times; and it would appear to have been of better quality than that of any other country except Spain. But the monarchs who endeavoured to establish the woollen manufacture in England instead of relying on our natural advantages for that branch of industry, sought to attain the end by prohibiting the exportation of the raw material. In the years 1337 and 1341, under Edward III., the export was forbidden by statute under a penalty of life and limb, and from that time forward for nearly five centuries the statute book was loaded with Acts equally absurd, and many of them equally severe, to prevent the "running" or illegal exportation of wool. Hundreds, if not thousands, of volumes and pamphlets

were issued to show that this was one of the first points of national policy, and that the country would be ruined if we allowed other countries to obtain our wool instead of manufacturing it ourselves. There are few things in the history of nations showing so entire an ignorance of political economy, and such outrageous blindness in statistics, as the history of the English woollen manufacture. It was not till the year 1824 that English wool was allowed to be exported; and it is amusing to recall the long struggle by which freedom was obtained for the export of our own wool, the import of foreign wool, and the import of foreign cloth—Lord Liverpool, Mr. Robinson, and Mr. Huskisson having alternately to play off the prejudices of the manufacturers and the agriculturists against each other. The import of foreign wool was only taxed from 1819 to 1824; but the amount of the duty, viz., 6d. a pound was most prejudicial. The Government succeeded in persuading the manufacturers, or at least some of them, to consent to the free export of English wool on condition of the free import of foreign wool, and afterwards, with the aid of the manufacturers, they prevented the agricultural interest from reimposing the duty on foreign wool. But the struggle was a desperate one, and it is humbling to remember that Leeds, Bradford, and Huddersfield were for years on the wrong side. They were happily defeated, and, still more happily, their defeat in this matter made them victors in the next great battle against protection, for there can be no doubt that the liberation of the trade in wool was a step to the liberation of the trade in corn, and thus the great, ugly, and unsafe edifice miscalled "protection" fell storey after storey, and human industry in all its branches stood upon the same fair level and solid foundation of freedom.—*Yorkshire, Past and Present.*

Waterloo, Iowa., has subscribed \$40,000 toward establishing an agricultural implement factory at that place.

The twenty-first annual fair of Warren Co., Ill., begins on the 24th of September, and continues four days.

Among the Cheviot hills of Scotland, they boast of sheep whose wool will measure eleven and a half inches.

About 23,000,000 pounds of Australian preserved meat were imported into Great Britain during the last year.

A considerable amount of blooded stock is being taken into Northern Iowa from Canada this Spring.

The *London Times* places the number of cattle in Great Britain, annually available for the butcher, at 2,336,000; and sheep at 11,033,000.

The proprietors of a farm in California are setting out 2,000 mulberry trees and twenty acres of English walnuts.

The English robin, a bird totally different in size color and habits, from the so-called American robin, is being imported into the United States for acclimation

The beet sugar factory at Freeport, Ill., expects to pay out \$60,000 for beets, this season. The factory is 200 by 300 feet and two stories high.

The Atlanta *Plantation* suggests that the drying of figs should become an item of agricultural interest in Georgia, where the fruit grows to perfection.

A paper at Corpus Christi, Texas, says that if it does not rain soon, Western Texas will be the greatest hide and bone country on the face of the earth.

A French silk factory settlement called St Etienne is being established on Staten Island. The colonists, who are all silk weavers, are employed by an association of French capitalists in New York.

THE County of Lincoln Agricultural Society held their annual Spring Show and Fair in Beamsville, on the 20th of April. There was a large and orderly turnout. The show of horses was particularly good, as also the bulls.

The Rev. W. W. Hibben having been elected Secretary of the Indiana Fair Association, which announces "an agricultural horse trot" for next June, one of the religious papers bewails "the unusual spectacle of a Methodist minister identified with racing."

Out in Oregon, recently, a land slide occurred, which carried a house and about 20 acres of ground a distance of a third of a mile, the house, fencing and land being unchanged and uninjured. Several persons were in the building at the time, but no one was harmed.

A Mississippi girl just out of school hired a few negroes last season and undertook to carry on the farm at the homestead. The result at the end of the year was eight banks of potatoes, 600 bushels of corn and \$969 in cash from the sale of cotton, after all expenses were paid.

A great Agricultural Congress to be held at Vienna, Austria, under the Presidency of M. de Chlumsky, the Minister of Agriculture, will take place in November next. The Austrian government has instituted this Congress to meet the desire for a reunion of this kind by the agricultural societies of Austria and Hungary.

NEW-YORK STATE FAIR.—At a meeting of the Executive Committee of the New-York State Agricultural Society—the fact being shown that a fund of \$50,000 has been secured in the county of Chemung, for the purpose of providing grounds and buildings at the City of ELMIRA for the Society's exhibitions, to be deeded to the Society upon the conditions proposed at a former meeting, it was resolved to hold the next Annual Fair and Cattle Show at that place; and the motion previously passed, fixing the date of the exhibition, was re-considered, and the week opening on the 30th of September was appointed for the purpose.

Miscellaneous.

How to Take Care of Harness.

Whenever leather is wet it loses a portion of its oil, and if suffered to remain wet long, it will lose all of this substance; and if this is not restored, the leather becomes dry and brittle.

Leather should be kept clean, for dirt of any kind will absorb the oil. The more leather is used and exposed to wet, perspiration of the horse, or other cause, the more frequently it should be oiled; it needs oiling oftener in summer than in winter; if not used at all, it should be occasionally oiled to keep it supplied with what is lost by evaporation. The patent leather parts of a harness, such as winkers, saddle, ect., should be rubbed over with some clean, soft oil, and immediately wiped off with a soft woollen rag or chamois leather; this is all the care those parts need. When not used, harness should be hung up in a dark closet, as cool as possible but not damp; it will stand the cold of winter better than the heat of summer.

To clean and oil a harness, hang it where all parts can be reached easily, (it would be better to unbuckle every strap); wash clean by sponge or woollen rag with blood warm water and castile soap, using as little water as will do the work; when two thirds dry, apply the oil with a woollen rag, pulling each strap through your hand; be careful that where the buckle holes are, a little more is applied; also the belly bands, breechings and the straps that buckle in the bits, need an extra allowance; let it remain in a warm place for a few hours, (not in the hot sun or before a hot fire) until the oil has well entered the leather; then rub off all that remains on the surface briskly with a dry woollen rag, and your work is finished. Be careful that you do not apply too much oil, and be equally careful that you apply it often enough.

The best oil for harness is one quart neat's foot oil, four ounces beef's tallow and three tablespoonfuls of lampblack; add four ounces beeswax for use in summer weather.—*Ohio Farmer.*

CARBOLIC ACID VERSUS MOULDS.—We find it stated in a contemporary that the decomposition of paste may be prevented by adding to it a small quantity of carbolic acid. In the same way, the disagreeable smell which glue often has may be prevented. If a few drops of the solution be added to ink or mæilage, they will not mould. For whitewash, especially when used in cellars and such places, the addition of one ounce of carbolic acid to each gallon will prevent mould and disagreeable odours. If such be its effects, it might probably be used with advantage in vineries peach-houses, etc., when being prepared for the season's work.—*Irish Farmers' Gazette.*

A Lecture on Rattlesnakes.

Two miles out on our road back we found Stradbug sitting like a statue, gazing at something in the road just ahead of him. "Come here, General Bradley," he called. "I want to introduce you to one of the inhabitants of this delightful country," at the same time pointing to a monster rattlesnake coiled in the trail. "I have been plaguing him," continued Strad, "and he is a game fellow. See," he added holding out his saber toward the reptile. Quickly the snake raised his chest, and sprang his full length, falling within two feet of old Strad's horse.

"Look out there, or he'll bite you," cried General Bradley. "Not a bit of it," replied Strad; "the fact is, general, I have been studying this specimen of the natural productions of this country for more than an hour, and I have found out, first, that he will not bite unless coiled; second, that he can only jump the length of himself when coiled." He then made the snake coil up again and strike two or three times. "He ain't much of a traveller either," said old Strad, whipping the reptile when stretched out and making it run as fast as it could. "He coils tail first," continued the experimenter, making him coil, "and like an honest fellow, gives fair warning before he strikes, which is more than some of our own kind do, general; besides, I don't believe he'd strike in the dark at all. You will readily observe," continued old Strad, growing facetious, "the difference between the nature of the snake and the dog; a dog shakes his tail to show you he is pleased, the snake shakes his tail to show you he is mad. I look at that eye, sir, I have looked a mutiner in the eye and disarmed him; but I would not like to look at that fellow steadily in the face for five seconds." The snake was coiled, his body resting on his tail, and his head raised to the height of a foot, and he looked proudly curved. His eyes shone like two little diamonds, and his yellow skin glistened in the sun. The spots on his back seemed ever changing from dark brown to a bright red color. "Come," said Strad, "I'll bet there's not a man in the crowd, an' shoot him in the head." (It is said to be almost impossible to shoot the head of a rattlesnake. The hunters declare that their sensitiveness is so great that they can feel the wind of the coming bullet and dodge it. Be this as it may, I have seen men who could hit a bull's eye or drive a nail at one hundred yards, that could not shoot a snake in the head.) Several revolvers were levelled and discharged at him, but the snake remained unharmed. A soldier then dismounted, and taking his carbine, at the fourth shot nearly severed the body of the reptile. "Foul!" cried out Strad, "you hit him in the body; but take off the rattles, the game is yours." The man did as he was bid, and there were eleven rattles and a button.—*Letter to Philadelphia Press.*

Dust in Cities.

Prof. Tyndall states that almost the whole of the dust in rooms is of organic origin, and prominent among these organic bodies is horse manure. The removal of this offensive contamination from the air of infected localities has been the subject of careful experiment and investigation in England by the London Board of Health. Not only have the droppings been removed from the streets but the surfaces of the pavements have also been purified by jets of water thrown by steam power, whereby all the crevices between the stones forming the pavements have been cleansed. In some districts the practice has been adopted of covering all surfaces that are soaked with foul organic materials with a layer of fresh earth. This has been attended with the most satisfactory results. The Val de Travers asphalt pavement is however regarded by Sir Joseph Whitworth, the great English authority on all questions connected with street economy, as offering the most promising relief from such organic dust, since its introduction will tend to hasten the employment of hot-air engines with India-rubber tires for all the purposes of street traffic, and the source or cause of the contamination will of necessity disappear.

Swindling the Farmer.

Every spring brings forth a host of advertisements to catch the eye of the farmer.—They are very skilfully worded and set forth enormous yields. Such an advertisement or circular I received the other day from some western man (name forgotten,) who claimed to have a very prolific field-corn; three stalks would average eleven sound ears. An acre would yield two hundred and fifty bushels of good corn, but he does not say two hundred and fifty bushels of shelled corn. Sandford advertised his little dusky white corn in the same way. A number of farmers in this neighborhood purchased it, and it proved to be a miserable failure; yet Sandford found purchasers at seven dollars per bushel. The Norway oats was another swindle, for which farmers paid an extravagant price. It was nothing more than the black Poland or Feather oats. And now we are to have a Late Rose potato, for which we are asked to pay a large price, and it may prove to be nothing more than the Garnett Chili, which is very similar to the Early Rose in shape and color. Farmers should be careful to purchase only from honest seedsmen, and give swindlers and speculators a wide berth.—*German town Telegraph.*

To DESTROY BUGS.—The best method of destroying bugs is to wash the woodwork infected by these vermin with a solution of carbolic acid in water, the strength of five parts of acid to one hundred of water. The insects are at once killed by the solution which also acts as a disinfectant.—*Ex.*

NATIONAL HEALTH.—Everything depends upon it. It is by continuous and persevering labor alone, handwork and headwork, that England holds its position against other countries more favored by Nature, but without a high standard of vitality—and that, as you know, implies more than a mere lengthening out of life-labor such as we require cannot be kept up. Again where you have to deal with men in masses, the connection between vice and disease is very close. With a low average of popular health you will have a low average of national morality, and probably also of national intellect. Drunkenness and vice of other kinds will flourish in such a soil, and you cannot get healthy brains to grow on unhealthy bodies. Cleanliness and self-respect go together, and it is no paradox to affirm that you tend to purify men's thoughts and feelings when you purify the air they breathe. It used to be thought that the vast unnecessary destruction of human life which takes place in all populous countries was, if a misfortune, yet a misfortune not without its compensations; because it was argued, if that destruction ceased, all the inconvenience of surplus population would follow. But that is a danger which we have not now to apprehend. There is no fear, in the present state of the labor market, of our being overdone with hands for whom no employment could be found; nor do I think we shall be so again, at least for a long time to come. The English laboring classes are getting over their dislike to emigration; and the attraction of new countries will tend to grow stronger rather than weaker. In Ireland, from that cause, population is already stationary or nearly so, and it is impossible to feel sure that the same condition of things may not prevail here also before many years are over.—*Lord Derby at Liverpool.*

BUSH-FIRES IN ALGERIA.—From time immemorial it has been the custom of the Arab herdsmen to burn all underwood from beneath the trees, to produce the tender shoots of which cattle are so fond. To give some notion of the enormous spread of these conflagrations, I have but to quote from the newspaper reports of 1865. In 1863, 110,000 acres were burnt in the province of Constantine alone; whilst in 1865 the damage done amounted to 253,755 acres. In the arrondissement of Guelma 35,600 acres were destroyed, The forest of Teleschoon was burnt straight down to the sea. (*Moniteur d'Algerie*).—*Hon. Lt. Wugfield (Under the Palms).*

An Indiana farmer, after trying to trap, poison and shoot the rats that overrun his premises, bought two goats and gave them the range of yards and stables. Within a week every rat emigrated and staid away until the goats were sold, nearly two years afterward, when they all came back with all their friends. A second edition of goats was procured, and since then not a rat has been seen on the premises.

IMPROVEMENT IN FARMERS.—The *Mark Lane Express* in an article on farmers associations, says: There is nothing more noticeable when reviewing the progress of agriculture during the last quarter of a century than the improvement which has characterized the conduct of our public meetings or social gatherings. There was a time when the long clay pipe, the somewhat boisterous stave, and the "hot stopping" were regarded as the chief inducements for getting farmers together.— But these days have gradually passed away, and, with some experience of other large assemblies, we are inclined to think that nowhere will men as a rule keep closer to the point or carry themselves more becomingly than the occupiers of land when they draw into a focus at a Society's show, or a Club discussion. More information has been disseminated, more intelligence developed by such a means than through any other cause which could be spoken to. By the further aid of a good reliable report this system of mutual advantage comes to be almost infinitely extended. Many a man who would fight shy of a Royal essay, although he found the pages ready "cut" to his hand, will eagerly turn to see what his next door neighbor had to say, or some more famous agriculturist to offer on the merits of the principle under consideration.

TRAPPING CUT WORMS.—An exchange says: It is very annoying after having set out a nice lot of sweet potatoes or cabbage plants, to see them cut down one by one by cut worms. We have tried ashes, lime, soot, and, in fact, every thing we have ever heard of, but never found anything effectual until, by accident, we found three or four of the worms one morning gathering under a small board which had been left by some children on a sweet potato hill. Acting upon this hint, we placed some small pieces of board, large chips, etc., all through the patch, and we trapped them by hundreds. The boards must be lifted early in the morning, and on very warm days again about noon. A little care for a few days will clear these pests out of the garden. One trial will satisfy any person of the merits of this plan.

STYLE IN THE PIG PEN.—A report says: A fancy farmer of Scott Co., Ky., is said to have built a \$2,000 hog-pen, which is painted and grained, furnished with hot and cold water, warmed with steam and lighted with gas. There is a fine library, where can be found Cobb's Elementary Works, the works of Bacon, Inquiry Regarding the Descendants of Ham, Hogg's poems, Colden on the Corn Laws, and the popular little poem, "Root Hog or Die." The troughs are of mahogany, inlaid with ivory, and furnished with Phelan cushions. Whenever a hog is led out to execution chloroform is administered.

A late San Francisco paper says strawberries will soon be a drug in the market, as there never was such a crop as the present season promises.

One pear tree, fifteen years old, is stated by a correspondent of the *Gardeners' Monthly*, in Springfield, Mass., to have produced \$320 worth during the years 1870 and 1871.

"HANKERING AFTER PURE AGRICULTURAL HOG PROFITS"—The trustees of the State Agricultural Society, of Maine, will offer \$2,000 in prizes for fast horses at their fair in the fall, and a sweepstake purse of \$100, open to the world. The last day of the fair will have a military review among its attractions.

The two best sugar manufactories now in operation in California have made large preparations for the coming season, which is the best possible indication that the enterprises are profitable ones. The Sacramento company have planted, 1,100 acres, while the Alameda company have planted 400 or 500 acres.

Remember, when you lose a horse, or ox, or any other animal, instead of leaving the carcass to be devoured by dogs or crows, you should cover it with six or eight times its bulk of earth, and thus arrest the fertilizing gases which would otherwise be thrown off. By so doing you will secure a quantity of manure worth ten times the trouble it would cost you. We have known farmers in this section to sell a dead animal for a dollar, when it was worth ten to them for manure.

AMMONIA FOR SNAKE BITES.—The Inspector of Police to the Bengal Government reports that out of 939 cases of snake bites, in which ammonia was freely administered, 702 victims have recovered, and in the cured instances, the remedy was not administered till about 3½ hours after the attack, on the average. In the fatal cases, the corresponding duration of time was 4½ hours.

Some wags were walking around an agricultural implement store, and they chanced to see in the rear a dressed hog hanging by a hook in the wall. "Ha! Ha!" cried they to the young man in attendance, "what sort of an agricultural implement do you call that?" "That," said he, "is a patent combined root-grubber, corn-sheller, apple grinder, gatelifter, double-action, back-spring, sod-plow; but I guess you won't want one, for it takes a mighty smart man to manage 'em."

Advertisements.

VALUE RECEIVED GUARANTEED TO THOSE WHO BUY AND USE

Nellis & Co.'s Agricultural Steels and Irons. Finished to suit customers. Patties will at all times secure genuine articles by selecting Steel Goods with imprint of our Trade Mark.



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SHORT-HORN CATTLE,

AND

BERKSHIRE PIGS.

THE subscribers will sell at Public Auction, at WILLOW LODGE (four miles from Brampton, G. L. R., 20 miles west of Toronto,

ON THURSDAY, JUNE 27th, 1872.

- 15 Pure bred Short-horn Cows and Heifers.
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- 1 Heifer of the cows and heifers have been bred to the one imported Bull, British Baron.
- Sale to commence at 1:30, lunch at 12:30
- Send for cat done with pedigrees

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A Sure and Easy Method of subduing Quack Cross.

Information can be had by forwarding one dollar to J. F. CROFT, Brighton, Ontario, post age prepaid v 16 H

FIRST PRIZE BEE HIVES.

BUY THE BEST.

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Moveable Comb or Frame Hives

ARE all that can be desired for a bee-hive. They were awarded the first prize at all the Provincial Fairs for seven years. They possess more advantages than any other hive in the market, yet are more simple in construction and easier to operate with, which we are prepared to demonstrate at any time. In fact, they are the best and cheapest frame hive now before the public. For full particulars send for circular

PRICE LIST FOR 1872.

Single boarded Hive.....	\$2 50
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Large Gauge or New Entrance, each.....	15
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Honey Knife.....	75
Honey Extractor—the best in the market.....	10 00
Iron in Stocks in the single boarded hive.....	18 00
Italian Queens, from last importation.....	5 00
Canadian Bee keeper's Guide, pre paid.....	25

Township and county rights for sale at great bargains

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All orders must be accompanied with the cash, and addressed to

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No Knife, No Caustic, No Blood, Little Pain.
GREAT CANCER ANTIDOTES.

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MANUFACTURERS OF

THE EASIEST THE SIMPLEST
THE LOCKMAN
FAMILY SHUTTLE
SEWING MACHINE
THE CHEAPEST THE BEST

HAMILTON, ONT.

v4-3 121

Office of the Appleton
Knitting Machine Company, }

Hamilton, June 1, 1872.

**THE APPLETON
KNITTING MACHINE CO'Y,**

ARE now prepared to exhibit their invention to the public. They claim for it a superiority over every other Knitting Machine.

It is perfect in its action, working smoothly and accurately, and will not get out of order.

It will knit close or open, plain or ribbed work. Knits in any shape, with single, double or triple thread,

WITH A PERFECT SELVAGE.

It will make a long, or short stitch, without stopping, and will knit backwards and forwards without tension on the yarn. In short, it has none of the defects of the other machines, and is an improvement on them all.

The standard of excellence of all knitted goods is that made by hand, therefore, it is required of a first class Knitting Machine, that it produces Stockings, Socks, Shirts, Drawers, Mitts, Scarfs, and all other knitted goods, as perfect as the hand made article.

The Machine is constructed in the most substantial manner, finished in first class style, and will last for years. It does perfect work, simple in construction, there is nothing about the machine but what may be understood at sight, and the most inexperienced may in a few hours acquire a knowledge of working it.

The Appleton Knitting Machine Company are prepared to submit their invention to any test or comparison with any other, and they desire no higher recommendation than that they feel assured will be accorded it by the Public.

A Book of Instruction is provided.

AGENTS WANTED.

Terms liberal, and made known on application to the Company, Hamilton.

Hamilton, June 1, 1872.

5-11.

Markets.

Toronto Markets.

"CANADA FARMER" Office, June 15, 1872.

The produce and provision trades have been quiet during the past month, closing with light receipts and generally limited demand. The movement in bread stuffs, especially is devoid of activity, under declining quotations from Liverpool.

In this city the wholesale prices are as follows:—

FLOUR AND MEAL.

Flour—Superfine, \$8 10 to \$8 15, Fancy, \$8 35 to \$8 40, Extra, \$8 50 to \$9 00.
Oatmeal—\$4 60 to \$4 70.
Cornmeal—\$3 25 to \$3 35.
Bran, in car lots, \$10.

GRAIN.

Wheat—Softest, \$1 50 to \$1 55, Treadwell, \$1 48 to \$1 50, Spring, \$1 43 to \$1 44.
Barley—No. 1, 65c, No. 2, 50c, to 55c.
Oats—\$3 7c to 39c.
Rye—Nominal, none offering.
Peas—75c to 75c f.o.b.

HAY AND STRAW.

Hay, in fair supply, at \$12 to \$22.
Straw, scarce, at \$10 to \$15.

PROVISIONS.

Beef, by the side, 9c, to 10c.
Mutton, by the carcass, 10c.
Potatoes—per bag, 40c, to 60c.
Pork—Mess, \$14 00.
Bacon—Cumberland Cut, 6 1/2c to 7c, Canada, 6 1/2c to 6 3/4c.
Hams—Salted, 9c to 9 1/2c; Smoked, 10 1/2c to 11c.
Lard—9c to 10c
Butter—Dairy, choice, 13c to 15c.
Eggs—Packed, 11c to 12c
Cheese—11c to 11 1/2c; Reesor's Stilton, 18c, Royal, 17c.
Dried Apples—9 1/2c to 10c
Salt—Goderich, \$1 27 to \$1 30;

HIDES AND SKINS.

Hides—No. 1, cured and inspected, per lb 9 1/2c to 9 1/4c, No. 1, inspected, green, 9c, No. 2, inspected, green, 8c.
Lambskins—20c, to 35c.
Calfskins—Green, per lb, 12c.
Wool—Fleece, 50c, to 51c.

THE CATTLE MARKET.

Beves (live weight) \$4 50 to \$5 50 per cwt.
Sheep—\$4 00 to \$8 00.
Calves—\$3 to \$10.
Lambs—\$2 00 to \$4 00.

MONTREAL—Flour—Receipts, 3,504 barrels. Market fairly active and buoyant at \$5.00; extra taken on the spot at \$7.00, no transactions in fancy; considerable supers. In round lots, and one hundred barrel lots placed at \$6 50 to \$6 65. No. 2 brought \$8 00; fine, \$5 45, and 500 of middling at \$4 50. Wheat—Car lots of white placed at \$1 60; \$1 55 offered for U. C. spring, to arrive, and \$1.50 paid on the spot. Peas—Neglected; 85c. bid. Corn—Cargo lots sold at 58 1/2c. Provisions—Generally unchanged. Ashes—unchanged.

HAMILTON, June 12—Flour, No. 1 super, \$9 50 to \$9 00, fall wheat, \$1 40 to \$9 00, spring wheat, \$1 30 to \$9 00, barley 55c to 60c, peas 65c to 60c, oats, 40c to 41c, cattle (live weight), \$5 00 to \$5 50, beef, \$7 00 to \$8 00, mutton, \$8 00 to \$7 00, dressed hogs, \$7 00 to \$7 50; hides, \$9 00 to \$8 00; sheepskins, \$4 00 to \$5 00; wool, 54c, to \$60c; butter, 11c to 14c eggs, 10 to 12 1/2c; cheese, 10 to 11 1/2c; lard, \$18 to \$19, potatoes, 65c, to 50c; corn, 60c, to 62c.

GUELPH, June 12—Flour, No. 1 super, \$9 00 to \$9 00, fall wheat, \$1 38, to \$1 42, spring wheat, \$1 32 to \$1 34, barley, 50c, to 55c, peas, 55c, to 62c, oats, 35c to 36c, cattle (live weight), \$5 00 to \$6 00, beef \$7 00 to \$8 00, mutton \$7 00 to \$8 00, dressed hogs, \$9 00 to \$9 00, hides \$7 00 to \$7 50, sheep skins \$9 50 to \$2 00; wool, 53c to 54c, butter, 12 1/2c to 13c; eggs, 11c to 10c; cheese, 10c, to 11c; lard, \$16 00 to \$17 00, potatoes, 60c, to 75c; corn, 60c, to 60c.

OTTAWA, June 12—Flour, No. 1 super, \$6 75 to \$7 00; fall wheat, \$1 40 to \$1 45, spring wheat, \$1 30 to \$1 35; barley, 50c, to 55c, peas, 60c, to 65c; oats, 32c, to 35c; cattle (live weight), \$5 50 to \$6 00; beef, \$9 00 to \$9 00, mutton, \$10 00 to \$9 00; dressed hogs, \$8 00 to \$9 00; hides, \$9 00 to \$9 00; sheepskins, \$2 50 to \$3 00, wool, 60c, to 60c; butter, 14c, to 16c; eggs, 14c, to 16c; cheese, 10c, 60c; hay, \$13 to \$16; potatoes, 17c, to 20c; corn, 65c, to 70c.

Contents of this Number.

PAGE.

THE FIELD:
Beet Root Sugar..... 181
Carrots and Mangels..... 180
Turnip Culture..... 187
English Farming; Talk with Farmers; Natural and Artificial Manuring..... 189
Superphosphate of Lime and Root, Crops for Soiling..... 190
Fences; Salt as Manure..... 191
Economise Manure, Swindling the Farmer..... 192
Items..... 192

STOCK DEPARTMENT.
Growth of Combining Wools, Advantages of Thorough-bred over Common Stock..... 193
Sheep; Past and Future Prices of Stock..... 194
Gestation of Cows; Abuse of old Horses..... 195
Cooking Food for Stock..... 196

VETERINARY DEPARTMENT.
Wardles in Cattle; Glanders in Horses..... 193
Tumour in a Cow; Swelled leg; Worms in Pigs..... 197

THE DAIRY:
Canadian Butter Trade; The Correct Weight of Milk..... 197
Dairy Farming in Scotland, Cooling Milk for the City Market..... 198

POULTRY YARD:
A Plea for Poultry Exhibitions; Poultry Houses; Montreal Poultry Exhibition..... 199

CORRESPONDENCE:
Prizes; My Farm..... 200
Fish Manure; Quefies..... 201

EDITORIAL:
Canada in 1871, or New Empire in the West..... 201
Public Lands in the North-West..... 202
Labor; Notes on the Weather..... 203

HORTICULTURE:
A Plea for House Plants; Dwarf Apple Trees; Influence of Colored Light on Vegetation; Massachusetts Horticultural Society..... 204
Horticultural Hints; Canadian seed Trade, Fruit Growing in Fitzroy Harbor..... 205
Pears; The Ribston Pippin; Grafting the Grape; Experience in Fruit Raising; The Grape Trade in New York..... 206
Laburnum, or Golden Chain, Water Cress; Drying Fruit; Items..... 207

ENTOMOLOGY:
The Codlin' Moth..... 208
The Colorado Potato Beetle..... 209
Ants and their Slaves..... 210

APIARY:
Great Mortality among Bees..... 210

POETRY:
Growing old, Weariness..... 210

HOUSEHOLD:
Country Homes..... 211
Filters and Filtering; Family Worship..... 212
Ironing; Clothes; To make Glossy Shirts; Farmers' Wives and Daughters..... 213
The "Why" in Vegetable Cookery; Protection against Moth; Light, air, and Water; Salad; New mode of Washing..... 214

AGRICULTURAL INTELLIGENCE:
Hamilton Township Farmers' Club..... 215
The English Royal Agricultural Society The Woollen Manufacture..... 216

THE CANADA FARMER is printed and published on 15th of every month, by the GLOBE PRINTING COMPANY, at their Printing House, 26 and 28 King Street East, Toronto, Ontario, where all communications for the paper must be addressed.
Subscription Price, \$1 per annum (POSTAGE FREE) payable in advance.
THE CANADA FARMER presents a first-class medium for Agricultural advertisements. Terms of advertising, 20 cents per line space. Twelve lines' space equals one inch. No advertisements taken for less than ten lines' space.
Communications on Agricultural subjects are invited, addressed to "The Editor of the Canada Farmer," and all others for the paper are to be sent to
GEORGE BROWN,
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