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THE CANADA FARMER

VOL. III. No. 4. TORONTO, CANADA, APRIL 15. NEW SERIES.

The Field.

The Canadian Root Pulper.

Mr. Palmer, of Mount Vernon, has furnished the following detailed description of the machine he has constructed for the purpose of pulping roots. He gives his brother farmers the full benefit of his own thought and ingenuity, which have been successfully exercised in the production of a machine that the Canadian stock feeder will find it greatly to his advantage to introduce into his farm economy.

CONSTRUCTION OF FRAMEWORK.

The framework consists of four posts, two side rails, two side boards and two cross rails.

The posts are made of 3 x 4 inch stuff, and are each 3½ feet long; the side rails are of 2 x 9 inch stuff 3½ feet long; the side boards are of 1½ inch stuff 19 inches wide and 3 feet long; and the cross rails are 2 x 4 inch stuff 1½ feet long.

The above dimensions are given as outside measurement.

Measuring 19 inches from the top of the post, a mortice is cut to receive the tenon of the side rail. The mortices for the cross rails are cut just above, and, of course, at right angles to those for the side rails. A groove 1 inch wide and 1 inch deep is cut into each post, from the mortice for the side rail to the top. This groove is to receive the side boards, which are simply slipped in after the machine is made and put together. Feet of a suitable length are firmly fastened, by means of mortice and tenon, to the bottoms of the posts.

CONSTRUCTION OF THE CYLINDER.

The cylinder is twelve inches long and ten inches in diameter. It must be made of the best material, such as a good oak knot. The shaft which carries it is twenty-three inches long and two inches in diameter. Beginning at one end of the shaft, and dividing it into parts, we have two inches for boxing, twelve inches for cylinder, two inches for

boxing, two inches for balance wheel and five inches for pulley.

It is important that the pulley and balance wheel should be on the same side of the machine, since then the other side is clear to remove the pulp from.

The pulley may vary in diameter according to the amount of speed desired. The one on my machine is twenty inches in diameter.



FIG. 1.

The shape of the teeth for the cylinder can only be shown correctly by a drawing. (Fig. 1). Their dimensions are 2½ inches long, ¾ inch wide at the widest part, and 3-16 of an inch thick—not ¼, as stated in my former letter.

I must here acknowledge my indebtedness to Messrs. Maxwell & Whitelaw, of Paris, Ont., for the form and manufacture of the teeth.

The teeth are made of the best of steel. In putting them in great care is necessary in order to have them all project exactly the same distance above the cylinder. In setting, bore a hole slightly smaller than the shank of the tooth. Drive in the tooth the proper

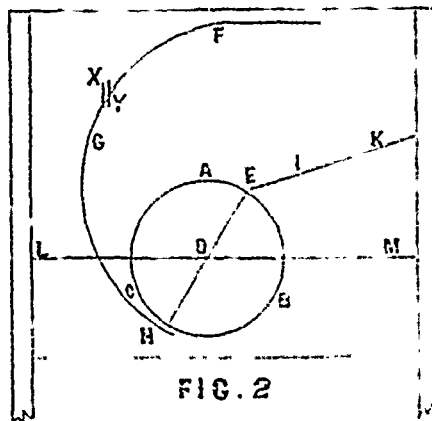


FIG. 2

distance, and, to hold it firmly, drive a large cut nail on one side of it. They should not

be set promiscuously over the cylinder, but in four distinct lots of twenty or twenty-five each.

CONSTRUCTION OF THE ARCH.

This is probably the most difficult part to describe clearly, as well as to make. Figure 2 exhibits to the eye the relative positions of the cylinder, arch, side boards and side rails.

In this diagram, *abc* represents the cylinder, the centre of which is *d*, *ghf* the arch, of which *e* is the centre; *ik* the feed board, extending from the hopper to the top of the cylinder; *lm* the line between the side rail below and the side board above. The diameter of the arch is twice as great as that of the cylinder after the teeth have been inserted.

The position of the arch in this diagram is slightly different from that described in my former letter. The change, however, I consider an important improvement upon the original.

The arch is necessarily in two parts, the lesser of which is built, as can be seen in Fig. 2, in the side rails, and the remainder in the side boards. It is composed of small segments slipped into a groove cut into the side boards and side rails. The groove is one and a half inches wide and half an inch deep. If the segments be made of hard wood it is only necessary to fasten a small iron bar to the bottom of the arch at *h* to prevent the too rapid wear of the wood; this bar must be set as close to the teeth as possible. If, on the other hand, the segments be made of soft wood, the arch must then be lined with iron.

To guard against thoughtlessness on the part of the operator, a hole should be cut through the arch at *xy*. The object of the hole is to enable the operator to clear the machine without putting his hand under the arch, for sometimes the roots will get wedged together, and so stop feeding. When this occurs, all that has to be done is to put a small stick through the hole, and start the roots on in their order.

The hopper is attached to the end of the machine opposite the arch. It need not be described by me, for if a man cannot make a suitable hopper without a description, he is not mechanic enough to make any part of the machine.

Finally, a box must be made to receive the pulp. This is done by simply nailing boards across the feet and upon the insides of the posts. Then nail up one end of the box and the thing is complete.

In the above I have described the original machine, with all the improvements which have suggested themselves to my mind.

If, in any point, my statements have been obscure, I shall be happy to answer, through the press, any inquiries which may be made.

I hope that manufacturers as well as farmers generally will see and take advantage of the few hints given.

NOTE BY EDITOR.—We are informed by Messrs. Maxwell & Whitelaw that they have imported from England one of Samuelson's pulpers, after the model of which the teeth referred to above were made.

Summer Fallows and Canada Thistles.

It is a general custom, amongst a great many farmers, to plough summer fallows early in spring, unless they have been previously ploughed in the fall.

Both plans are bad, and in my opinion, where the land is infested with thistles, all waste labour. If the land is wet and needs surface draining, ridge and furrow will answer well for that purpose, but will be equally objectionable, so far as killing thistles is concerned. Nothing assists the growth of thistles more, and impedes their destruction to a greater degree, than moving the land whilst wet in the spring or fall. The more you plough, under such circumstances, the more thistles will flourish afterwards. Ploughing in the fall and again in the spring, for spring grain, exactly coincides with this theory, and every one knows how thistles gain under such regimen.

The working of clean land is not, of course, here alluded to, for almost all our fields are now, alas, more or less infested with thistles. For many years I followed this course, and grew more thistles than any thing else, and certainly more thistles than I ever saw grown elsewhere. I sowed large quantities of spring grain, and any fallow I had, was always ploughed in the fall or early spring, and consequently when the time came to kill thistles by working amongst them during the hot dry months, they were young, green and succulent, and very difficult to kill. They had not had time to grow and almost mature their seed, as they would have, had they been let alone, and hence, in strict accordance with Nature's rules, the plant, under these circumstances, makes great efforts to recover itself, and so

mature its growth and seed. In the latter part of June, under this treatment, thistles will be about twelve to fifteen inches high, and in full vigour of young growth, with little seed showing.

Now, my plan is quite different. I never plough or disturb the fallow land infested with thistles until June, and then they are often three to four feet high, in my rich clay land, and many of them forming seed; in fact, their growth is about done, and they only seek to mature their seed. Now is the time to go at them. The land is comparatively hard, and ploughs up very rough—and the rougher the better, and the larger the furrows turned, the rougher the land will lie. Much of the land so ploughed will lay up quite hollow, and expose a surface many times larger than the area of the land; the sun gets into and under these lumps, and being much exposed to the action of the air, the soil becomes completely dried, and every thistle that remains in a clod so exposed and dried will die, and in fact is dead in a week. As soon as ploughed once do not go and harrow all down smooth again, for that course is the very worst you can follow. You can easily perceive that by these means you cover up all thistles exposed, and so prevent their death being entirely completed, where there is some remains of life left. But instead of harrowing, put in the plough again, and move all the under soil to the top, and enable it to obtain more ammonia and nitrogen from the air. While in this state of rough surface, so much is exposed that the land is absorbing at every pore from the atmosphere, and on a surface exposed to the action of the air a great deal larger than its flat area. Whereas, if the land was well harrowed down, the surface exposed for such absorption would be but little larger than its absolute area. Weeds also vegetate more freely, in this case, and in direct ratio with the surface so exposed. Three such movings, if the weather be dry, will entirely exterminate all thistles; they are dead, root and branch; they have for that year lost the natural and extreme tendency to surmount all difficulties and mature seed, as they had nearly done so before being disturbed, and hence are much weakened, and five times as easily killed. This course particularly applies to clay land, and is the mode of working fallows in England, so far as the rough surface is concerned, amongst the more intelligent farmers, especially where steam cultivation is practised. They do not absolutely plough, but do what they call "smash up" the land with powerful cultivators, whose tines or teeth penetrate from twelve to fifteen inches, leaving the soil very rough and the surface soil always on the top; and in many sections where the land is clean, this is considered the best mode of cultivating, unless where manure has to be buried, or weeds or sod killed. Let

those who are sceptical try this plan alongside a piece worked in the old way of fall ploughing, and again in June or early in July, and again for seeding, with intermediate harrowings. My piece will be clean and free from thistles and weeds, whilst the other will be as foul as ever. My three ploughings are applied just when the heat is greatest, and will be found most efficient in their action.

I entirely cleared twenty-seven acres of land, last summer but one, by this course, and as yet no thistles are to be seen, where, when I began, they could be counted by millions. Some were so high that I had to move them before the horses could go into them.

C.

Cultivation of Barley.

That hurried season of Canadian farming, seed time is to all appearance fast approaching. I would now treat in their order the cultivation of the various spring crops most widely sown by our farmers, not professing to lay down arbitrary rules for their guidance, but simply with the intention of somewhat refreshing our minds, by briefly touching upon those several peculiar and most important points which should be ever borne in mind as we prepare our land for each different spring crop. Of late years, the breadth of land over which barley has been sown has steadily increased in Canada, until its area has encroached greatly upon the old fall wheat crop.

The principal varieties of barley are the two-rowed and six-rowed, the former cultivated largely in Europe, but little in this country. It is also both a winter and spring grain, but is sown only at the latter season in Canada.

To secure a good crop of barley a judicious choice of seed is essential. In choosing our seed, we cannot do better than follow the advice of Loudon, who says:—"The best is that which is free from blackness at the tail, and is of a pale lively yellow, intermixed with a bright whitish cast, and if the rind be a little shrivelled, so much the better, as it indicates thin skin." Barley may be sown upon a grass or clover ley, if such be clean ploughed in the fall, or after roots. Thorough pulverization of the soil is an essential element in the successful cultivation of barley. For this reason every farmer should use his utmost endeavours to have his barley land for the succeeding year fall ploughed, as our Canadian frost is the most thorough disintegrator that we can employ. It is well to sow barley early, but at the same time it were better to be too late than to sow before the land be thoroughly warmed for no crop succeeds well that is checked in its earliest growth.

Barley does not require a deep seed-bed, but that seed-bed must be thoroughly worked. If we cross-plough, let us do it

shallow. I believe the gang-plough to be the best implement for the ploughing of land in spring. One of the best crops of barley that I have seen in Canada was sown upon the bare winter fallow, covered with the gang plough, and crossed with the harrows. A most important point, too often overlooked, is the use of the roller. It should be used *after* the plants are well through the ground; it presses the soil round the roots, and destroys many insects. I have often seen fields of young barley which looked yellow and sickly restored to perfect greenness by the pressure of the roller.

From two to three bushels to the acre is the usual allowance of seed.

C. E. W.

Turnip Culture.

A paper on this subject was read by Mr. John Weir, Jr., of Flamborough, before the Ancaster Farmers' Club. Although the turnip sowing season has not yet arrived, we should arrange our plans to secure a good braird and quick growth of roots. The paper was listened to with marked attention, and read as follows:—

To cultivate turnips successfully, a good deal of labour and attention are indispensable, and perhaps, were we possessed of a thorough practical knowledge of their culture, and that proper mode of treatment exactly suited to the requirements of our climate, we should not so often hear of a want of success.

The most desirable soil for the cultivation of this root is a sandy loam free from stagnant water—one easily worked to a considerable depth, notwithstanding that a heavier crop may occasionally be obtained from a clay loam.

Early in the fall the land intended for turnips should receive a heavy coating of farmyard manure, and be deeply ploughed; cross-ploughed in the spring about the end of May or beginning of June, harrowed and rolled until a fine tilth is secured. Getting the soil into a finely divided state is a matter of the highest importance, especially in our country, for at the planting season the sun will have become very powerful, and we have frequently hot drying winds, which, unless the land be harrowed immediately after the plough, will penetrate to nearly the full depth of the furrow.

It is a well established fact that all soils have the power of absorbing and retaining to a greater or less degree a certain amount of moisture, and the more finely divided and thoroughly pulverized the land, the greater amount of moisture will it absorb and retain.

By thus treating the land two or three weeks before sowing, the seeds of fowl weeds will be afforded an opportunity to sprout, and may, by the use of the cultivator, be easily destroyed previous to drilling.

Among the several kinds of artificial manure which may be used with advantage upon

the turnip crop are bones, superphosphates, and guano. One of the chief benefits derived from an application of those manures is caused by the fact that they possess in an easily soluble form, nearly all the constituents required by the plant, and thereby cause a vigorous growth and carry it quickly into the rough leaved state, at which stage it is free from the attacks of the fly.

It would be very difficult to state absolutely when is the best time to sow, inasmuch as soils and seasons vary. On clay or clay loam perhaps the most desirable time is from the 5th to the 15th of June, and on sandy loams from the 10th to the 20th of that month. The quantity of seed required per acre will also vary with the weather. In damp weather on sandy soils 2 lbs is ample, and on clay loam and in weather ordinarily dry it will be well to sow 3 lbs or even more.

The depth of the seed should be from 1 to 1½ inches below the surface.

It is better for plants to come up thickly, for they grow faster than when thin, and are more apt to escape the ravages of the fly; and moreover, they require immediate attention as soon as they are large enough to thin.

Sowing upon drills is altogether preferable to sowing on the level; not only can a much larger crop be produced, but the weeds are far more easily destroyed.

The distance between the drills should be from 26 to 30 inches, and the plants should be left, by thinning, 12 to 15 inches apart.

When a good braird has been secured, the great secret of success is in stirring the soil frequently when dry, and keeping the ground perfectly free from noxious weeds.

Harrowing the Fall Wheat.

Owing to the running together of our heavier lands by the mechanical influence of the snow and spring rains, our wheat fields often come out of the winter season in that state most expressively described as hide-bound. In the old country, they even go so far as to hoe the wheat between the drills. Such a plan, where labour is scarce and the season short, would be impracticable; but a free use of the harrow over our wheat in the spring has a very beneficial effect.

When spring has fairly set in, and the land has become sufficiently dry to allow the harrow teeth to work through the soil without clogging, let the harrow be passed freely through the wheat. The crust which tightly encircles the wheat plant is thus broken, and the coronal root has an increased freedom given to it to extend in every direction to seek for its proper food, and obtain a good foothold upon the soil. This operation may be performed with advantage upon almost any kind of soil, the weight of the harrow being greater or less according to the consistency of the soil in which it may be worked. It is especially adapted to the stirring of wheat that has

been sown by hand, and upon the heavier soils. The harrows not only break the crust of the earth, but drawing the fresh mould upon the wheat plant, they thus give a perfect top dressing.

Many have been "scared" at the appearance presented by their wheat field after the operation, but as long as the scarifying of the wheat has not been so severe as to tear out a *great* number of the plants, it will have the desired effect of pulverizing the upper soil, and will most certainly tend to give a rapid start to the growing plant. It should, however, be executed when the plant begins to re-vegetate, and personal care and supervision must determine that point. If the work be done when the plants are yet torpid they may be rotted, and if done too late their growth may be checked.

There is yet another great advantage in the operation. If we intend to seed down our wheat, after this harrowing is the time to sow our grass seeds. They will fall in a good bed, and the next smart shower will cover and sprout them.

Tapping Maple Trees

Much injury is often ignorantly and thoughtlessly inflicted on sugar maple trees by excessive tapping, and various negligent practices in connection with the operation. As a guard against such malpractice the following hints from one of our American exchanges may be useful:—

1. Use nothing larger than a three-fourth inch auger or bitt. One-half to five-eighths of an inch is best.

2. Do not open the trees until they will unqually well on all sides.

3. Select the thrickest part of the tree that is farthest from an old orifice.

4. Never put more than one spout to a tree that is less than one foot in diameter, nor more than one bucket to one less than 18 inches in diameter.

5. Never bore trees more than once in a season, but freshen them once, or any time after a long and hard freeze.

6. Never leave the spouts in the trees a single day after they have finally done running. The quicker the orifices dry, the less they decay.

The following facts should be remembered:—

The root of a tree will sometimes run more than the body. A healthy tree runs in proportion to the size of its top, and should be opened with respect to its capacity for production. Trees in open grounds, with spreading tops, discharge more and much sweeter water than those in a forest.

A patent has been taken out by a Mr. Stewart, of Edinburgh, for the construction of India rubber wheels, which are said to be extremely durable, and suitable for even rough roads and extremes of climate.

Our Roads

IV.

BY ALAN MACDOUGALL, C. E.

The most common road one meets in this country is the clay road; it is met with in every township in all its stages, with a road-way winding through stumps to a good broad road the full width of the concession allowance. From the formation of the Western peninsula, clay is the principal substance on which the roads have to be made; those parts over which roads are carried on a rocky or gravelly bed bear but a small proportion to the miles of clay roads.

These clay roads are not bad institutions in their way and time, and in good dry summer weather are not to be despised; but they all labour under so serious a drawback, that they are apt after the slightest rain to get into disorder, and in the wet seasons of the year to become so thoroughly impassable, that our attention cannot be too strongly drawn to them. As the general rule, all roads are laid out by Government in perfectly straight lines, irrespective of hills and valleys, ups and downs; they take everything as it comes to them. On clay roads the effect of judicious grading tells more favourably than on roads through harder soils, and as the same remarks about the principles of road formation apply to all kinds of soil, the subject of what is the proper course to take in laying out and forming a road can best be treated on that substance that is most capable of improvement.

The importance of designing a proper ruling grade, as also the necessity for grading roads, have already been noticed; let us now examine into some other of the *modi operandi*. The first thing that must be attended to is the water, either what falls on it as rain or melts on it from snow, or comes upon it from the neighbouring lands. Water is always a troublesome thing to deal with, one either gets too much of it or else too little; but on a road it is always preferable to have the latter. The road allowance between any two concessions, has been fixed for the distance of one chain or 66 feet; the whole of this distance is never taken up for the purposes of the road, but it is kept for the purposes of shovelling snow off the travelled road, or of taking stuff to make the road.

For all purposes a road bed of 25 feet will answer the country for a great many years. If, therefore, the 25 feet in the centre of the grant be used for traffic, there will remain a space of 20 ft., 6 ins. on each side of the travelled portion to work upon. The fences chiefly in use at present, are the snake fence, and usually take up 4ft. to 5ft. in the "worm;" but with this large deduction, there will still remain a space of 16 ft. or thereabouts. In the centre of this space a large ditch should be cut, from 2 to 3 ft. in depth, at least, one foot wide at the bottom, and from 8 to 10 ft wide at the top; from these ditches tap

drains should be taken across fields, where necessary, to some creek or outfall, and they should always be so graded that the water from them can get away easily. The stuff taken out of them should be spread over the surface of the road, thereby making it higher in many places than the land around it, and in other places, such as dips and hollows that are likely to be affected by wet, raising the road out of the danger of being constantly in bad order. The great advantage of the side ditches shows itself far more favourably in low and wet places than on a level or rising part, as the road being raised up into an embankment, is in a good position to be constantly kept dry, and is not in danger of being snowed up.

The Economy of Agricultural Machinery

THE DRAG SAW.

The other day I made a call upon our neighbour on business. When this had been transacted we soon got deep into a genuine farmers' gossip. It was a lovely day in November, clear and cold, and all along the road I had observed the teams steadily at work in the fall ploughing, a work which the forehanded farmer will push upon every available day. Surprised to see that my neighbour's team was not at the same job, but was picking in his pasture, I put the question to him, "How is it your man is not at the winter fallow this fine day?" "Well, the truth is," was the answer, "we were out of wood, and I had to send him down to the bush to bring some up, for the evenings are getting plaguey cold." To-morrow the man will have to go into that firewood with the bucksaw, an implement which has with much justice earned the soubriquet of "Canadian fiddle."

What valuable time is thus lost! Now, this, says the reader, is *apropos* of what? I answer, when we see a man wasting valuable fine weather in the fall, we may safely assume that he has also lost many important hours in harvest time, and at other important seasons, in the same manner.

My plan, and I commend it to farmers, is to obtain a day or two's use of a circular or drag saw and horse power, during the winter or early spring, and cut up a stock of firewood. In this manner we never have to stop the plough or the reaper, and take up the bucksaw, to the detriment of our more important work, and to the continued aggravation of the temper both of the farmer and his family.

It is true that the purchase of a horse power and saw will take a considerable sum, but I will endeavour to show that the saving effected will more than repay the extra outlay of capital.

The value of a horse-power upon a farm I need hardly dwell upon; its application to the root-cutter and the chaff-cutter, both

absolutely necessary to the farmer who feeds many head of cattle, is so generally approved of that the majority of our better class of farmers look upon the power as an essential in the proper stocking of a farm.

A drag-saw, which is more useful to the farmer than a circular, may be obtained, with patent truck for moving the log, for from \$70 to \$80. The advantage of this form over the circular is that it may be used in cutting up long logs into stovewood lengths. To use the circular the tree must be first cut into cordwood, of such a size that it may be handled. In all our woods, there is much dead and lying timber, which it is very hard to work up with the axe, and this may instead be cut into very long logs, and then cut up with the drag saw. Thus there is great economy in the utilization of dead and fallen timber, which, though making the best of fuel, is too often left to rot in the bush from the difficulty to be encountered in cutting up by the axe.

By logging up a quantity of loag lengths in a clear space in the woods, or by bringing them to the house yard, a sufficient supply of wood may be cut into stove lengths in two or three days, to supply a large house for the year.

The work of splitting this short wood is, of course, very much lighter than that of splitting cordwood lengths.

As the saw would only be required once in the year, let four or even six neighbouring farmers club together to purchase one, and each could have the use of it, without inconveniencing the rest. If four clubbed, each man's share would be only twenty dollars.

Let us now put side by side the relative cost of cutting with the "fiddle" and that done by the drag-saw and power:—

COST OF CUTTING SIXTY CORDS OF HARD WOOD,	
BY HAND.	BY DRAG SAW.
Cutting, splitting and piling in bush at 65c \$39 00	Cutting and piling in long lengths will be about 30c per cord. \$18 00
Drawing home cordwood.	Drawing home stove lengths
Cutting up at house at 50c. per cord. 30 00	Cutting
	3 men, 3 days at \$1 00 per day. 9 00
	1 boy to drive at 50c. 1 50
	2 teams, 3 days at 1 50 per team. 9 00
	Balance in favour of drag saw 31 50
	<hr/>
	\$69 00 \$69 00

We have then by the use of the drag-saw economy in the utilization of dead and lying wood, also a saving of \$31 at least in the working up into stove lengths of sixty cords of wood.

The cost of hand cutting is also set down at a lower figure than is generally paid, so that the saving by the drag saw would be even greater than the sum here estimated.

C. E. W.

Formation of a Fish Pond.

Having had some experience as a landscape gardener, I offer a few hints respecting the formation of a fish pond, which may possibly prove useful. It would be difficult to give a correct plan without some knowledge of the location. The ground should be retentive—clay is the best; mark off the sites with pegs, then take off the top or surface soil, and remove it to some distance beyond the line; then dig out to any depth desired, gradually sloping from the edge to the centre, if a small one; if large, it may be carried at a level, after sloping to the desired depth. Any portion of the excavation not retentive, should be filled with puddled clay—i. e., clay made of the consistency of putty, and well worked, by means of wooden rammers with rounded ends, not less than twenty inches in thickness.

Should the pond be on a lawn or level plateau, the soil excavated may be formed into an embankment, the slope of which should not be at a less angle than 45 deg. on the inside; that of the outside about 50 deg., and the top as level as possible, and well-defined edges. The surface soil may now be laid on the embankment, and well beaten or rolled. A small pond of this kind may be made both useful and ornamental. Numerous varieties of the bony tribe would doubtless succeed—the carp family particularly.

It may be used also as a convenient bathing place, if the embankment is planted with shrubs, which will greatly heighten the effect. On a small scale, the outline should be curvilinear, as sharp lines have always a harsh appearance to the eye.—*Cor. Southern Cultivator.*

Thick vs. Thin Sowing and Hand vs. Drill Sowing.

STR.—Thin sowing is so strongly advocated by some favoured with a moister climate than ours that the results of a trial of it against medium and thick sowing will prove useful, and may serve to steady our opinions and practice upon that question. The following was tried last season upon Mr. Lawson's Blennerhasset farm, and the winter being a severe one, was well calculated to test the matter thoroughly. The severity of the season is well shown by the comparative smallness of the yield, the best not giving eight Carlisle bushels (a Carlisle bushel is three Imperial bushels) per acre. The field sloped gently to the north, and the soil was too light to be a good wheat soil, but was otherwise in fair condition. The previous crop was first year's hay. The land was well grubbed and ploughed in September, and the wheat sown Oct 22, in favourable weather.

The seed—Hallet's white pedigree, of two years' previous home growth—was well brined before sowing.

Each plot was two drill widths, and measured over a quarter of an acre, except the

hand sown plot (broadcast), which was one measured acre.

Plot	Drill	Rows	Seed per Acre (Bushels)	Yield (Bushels)	Weight (Pounds)	Straw (Cwt)	Straw (Tons)	Straw (100 of)
1	1	1	1	842	34	17 1	17 1	17 1
2	1	2	1	95	21	17 6	17 6	17 6
3	1	4	1	711	1	21 2	21 2	21 2
4	1	8	1	577	3	21 2	21 2	21 2
5	1	16	1	693	0	17 0	17 0	17 0
6	1	32	1	836	1	30 3	30 3	30 3
7	1	64	1	1280	1	31 2	31 2	31 2
8	1	128	1	1600	1	31 2	31 2	31 2
9	1	256	1	1146	1	31 2	31 2	31 2
10	1	512	1	1117	0	31 2	31 2	31 2
11	1	1024	1	925	1	31 2	31 2	31 2

The results show that hand-sowing is inferior to the drill. Of the drill sown plots, 1 1/2 bushels in six-inch rows gave the best return, but taking the experiments as a whole, the eight-inch rows prove superior. For quantity of seed, two bushels per acre seems the best, and by analysing the results closely it will be found that any seed over that lessens the crop.

Plots 6, 7, and 8 were sown at as near the same rate per acre as the drill would permit, Plots 2, 3, and 8 had the same quantity of seeds per row, giving of course different quantities per acre; plots 4 and 11, and 5 and 10 had also same seeding per row.

From further analysis of these results some interesting facts might be deduced, but enough has been said for practical purposes.—*Cor. Carlisle Journal*

DURABILITY OF TIMBER.—Wooden water pipes were recently taken out in Woodward avenue, Detroit, laid there forty-three years ago. The wood is apparently as sound as ever, showing no signs of decay, even retaining the bark, and on cutting through it into the wood, the timber was found as bright and sound as ever. The pipes were made of tamarack logs, about sixteen feet in length, and eight or ten inches in diameter; bore of log, three inches in diameter. The pipes were disconnected from the distribution pipes several years ago. They were embedded in clay at a depth of four or five feet

Wheat—Its Climatic Limit on this Continent.

In extensive districts in Florida, and in all parts where Sea Island cotton is cultivated, the atmosphere has too great humidity for wheat culture to be profitable as a regular farming operation. An excess of moisture in the air, which cannot be drained like a wet soil, combined with an excess of heat, forbids the cultivation of wheat as a staple in sections where rice, cotton and sugar-cane may be grown to much better advantage. A warm, damp atmosphere favours the multiplication of all parasitic fungi, like mildew, rust and smut on wheat, to an injurious extent, while that cereal is rich in aliment for the nourishment of all fungals. The elements being largely in their favour, they literally devour the planter's wheat.

Rising into a dryer and cooler atmosphere as we leave the sea, we find a wheat climate in central Georgia, Alabama, Mississippi, and in large portions of Louisiana and Texas, west through Mexico to the Pacific. There are extensive areas in the southern part of the wide wheat zone on this continent, where irrigation is both needed and practicable. There is reason to believe that the ancient inhabitants of Mexico practised irrigation far more extensively than is done by its present population. Preston, the historian, speaks of a canal some 500 miles in length, used for that purpose. With our present wonderfully rapid increase of consumption of wheat, reaching one hundred millions in thirty years, in the United States, it is easy to see in the future the melting snows of the Rocky Mountains watering land for wheat where many believe no wheat will ever grow. That the summer and winter temperature of California, Oregon, Washington Territory, Utah, and all that vast region, meets the requirements of this plant at the base of mountains and over extensive plains, is a fact well settled. Strong alkaline soils need only a fair allowance of the water that forms such magnificent rivers as the Missouri to change them from barren wastes into wheat fields of uncommon fruitfulness. Farmers who cultivate impoverished wheat and corn fields east of the Mississippi river, will one day receive invaluable assistance from the alkalis of the West. When science, labour and capital shall combine and utilize the resources of this continent in the raw material for making wheat, with the climatic forces alike necessary to its production, one may fix its limit with some degree of certainty. Wheat grows far down Mackenzie's river, in British America; Richardson states that "it is raised with profit at Fort Liard, lat. 60° 5' north, long. 122° 31' west, and 400 to 500 feet above the sea." This locality, however, being in the vicinity of the Rocky Mountains, is subject to summer frosts, and the grain does not ripen perfectly every year, though in favourable seasons it gives good returns. July and August,

in northern latitudes, may have a mean temperature sufficiently high to meet the requirements of this cereal; yet the crop may be injured or ruined by a single frost. Hence the limit to its cultivation north is very variable. It will ripen its seed at a lower temperature than Indian corn. The cool summer climate of England brings wheat to great perfection, but fails to ripen maize. It differs also from maize in being able to withstand the severe freezing of winter in northern Asia, Europe and America. Humboldt, in his "Central Asia," names a place where the ground only thaws in summer to the depth of three feet, and mercury is frozen two months in a year, that has nevertheless a continental summer heat (61°) sufficient to give 15 bushels of wheat at the harvest for one of seed sown. It is continental summer heat that carries wheat and corn so far north in North America. Our great lakes equalize our too changeable climate, and thereby promote the growth of wheat and other cereals, of grapes, peaches, pears, apples and other fruits, in a remarkable degree. They absorb solar heat largely when it is in excess, and give it out freely when there is a deficiency. Make the soil on all the territory that surrounds these great lakes, what it ought to be, and its capacity for raising wheat will remind only settlers of the crops once grown in Western New York, Canada and Ohio —

Cor. Country Gentleman.

How to raise Lucerne.

The following valuable communication is from Mr. Richard Gibson, of New York Mills, on the cultivation of that excellent soiling plant, Lucerne:

Respecting the cultivation of lucerne, I will give you my experience with great pleasure, as I feel convinced that it is a soiling crop which has only to be tried to be more generally grown. It is essentially a soiling crop, being ready to cut in the spring before red clover, and continuing to produce heavy cuttings all through the summer, no matter how hot or dry. Last season, though unusually dry, did not appear to check its growth, as we were able to mow over one portion of a field five times, and another, only seeded last spring was cut four.

There are crops that will yield a greater weight of feed per acre at one cutting—corn, for instance, and which is a crop that lucerne cannot supplant, as it yields a very heavy weight of green food at that season of the year when most of our dairy farmers are requiring such. But as a soiling crop proper, I know of none that can compare with lucerne, and one that few farmers can afford to be without. It yields a heavy weight of feed all the summer, of excellent quality, and one that does not require the expense of ploughing and re-seeding after each cutting, nor each year, as by proper management and on suitable soils it will remain profitable five years.

Its relative value, as compared with corn, is decidedly superior, our sheep and cattle not only preferring but "doing" much better on it. In fact, corn with me has not proved a very satisfactory soiling crop—cattle fed on it generally losing flesh—until we have all but given over growing it for that purpose.

"The first hay we have this winter—that is our calves and sheep prefer, is that a little lucerne in it. Going on to the hay the other day, I saw a hole cut in it. Inquiring the reason, I ascertained that the shepherd had found where a load or two of hay, with a little lucerne sprinkled through it, had been mowed away, and that he had been getting it for his sheep, as they ate it better than good clover hay.

A rich, dry soil, with an open porous subsoil, is the most congenial to the growth of lucerne; but it will succeed well on any soil that will grow red clover to perfection.

The seed may be sown broadcast, or in drills 10 to 12 inches apart. In England we generally followed the latter course, so that after each cutting, or as often as might be necessary, we could run through the horse-hoe, to loosen the soil and destroy weeds, &c., and by these means the crop could be grown successfully ten years. But here I have generally adopted the former plan, sowing from 12 lbs. to 15 lbs. of seed per acre, as early in the spring as the season will permit.

The soil should be thoroughly prepared in the fall, by deep ploughing, and manuring with rich, well-rotted dung, or what would be perhaps better, 30 to 40 bushels of bone dust per acre, there being less liability of having foul seeds introduced, as this is a crop that is easily choked or run out by weeds, &c.

In the spring the soil may be lightened with a two horse cultivator, or scudger, making a fine surface mould. The latter is essentially necessary to get a good plant. The seed being very small, will only require lightly brushing in.

The after cultivation will consist yearly of a good top dressing of well-rotted dung, in the fall, and harrowing and rolling in the spring.

As I said before, weeds easily choke it; it will therefore be advisable to select a rich piece of soil free of weeds, and sow after some hoe crop, such as roots or potatoes.

The first season will yield a fair crop, but the second, third and fourth will be the best. —*Utica Herald.*

NORWAY OATS—Our American exchanges are beginning to denounce what they now term the "Norway Oats Swindle." The *Graphic* to the *Terraph* from the first discouraged the speculation, and the *Prairie Farmer*, which at one time extensively advertised them, now cautions its readers against the most prominent dealers in this belauded and marvellous variety of oats.

LIFTING POSTS.—A writer in the *Country Gentleman* tells how posts may be easily lifted from the ground by the use of oxen and a long chain. The chain is put around the post at the base and a stout prop put under it a few feet away and inclined towards the post, then let the oxen draw. There are very few posts so tight in the ground, he says, that they cannot be easily removed by the strength of two stout oxen. In this way, a long line of fence may be removed in a single day. The shape of fields is sometimes greatly improved by a change in the boundary fences, and lanes and cattle yards rendered much more convenient where a removal of the lines can be made. We do not see why a span of horses may not be used in place of the oxen.

Stock Department.

My Experience in Keeping Sheep.

My first experience in keeping sheep commenced by a friend giving me one young ewe. She was astray and was known to belong to the giver, but was not thought worth sending a man several miles for, and, consequently, was a gift of but little value. This ewe had two ewe lambs the following season, and a year from that time the three ewes had six lambs, and the following year my flock reached nine ewes and several wether lambs; all lived and did well, and cost very little to keep, and the mother of the whole flock sheared thirteen pounds of wool the first time. When cut off, the fleece was certainly much larger in bulk than the sheep. The wool before shearing nearly swept the ground. It was wonderfully long, and tolerably fine; some of her progeny sheared good fleeces, but nothing like this. I thought this fine, easy, and profitable work, and after some deliberation determined to go into sheep farming on a large scale. My farm was very large, nearly 350 acres cleared. The next summer I bought 339 lambs, mostly ewes, all fat and in good case. Sheep and lambs were high that year; I paid \$2 25 each for them all round. They were delivered to me about the beginning of August. They did exceedingly well for some months, as I had splendid feed for them, and they became quite fat, so much so that I lost several by their getting down on their backs, and being unable to rise, they died before assistance could be rendered. Most of the flock being ewes, and all of a reasonably good sort, I determined to keep them for breeding, and hence refused a good offer for them that fall, whereby I could have made some money. The autumn rains set in early that year, and were very cold, accompanied by snow and sleet storms. The sheep suffered much, having no shelter, and before the middle of November, when plenty of shelter was provided, several showed signs of failing health; still, as food was abundant and the bad weather must then soon be over, I thought little of it. The hard dry frost I felt must soon come, and the sheep cease to be exposed to pitiless rains. I had 150 tons of hay, and meant to keep most of the sheep over the winter. About this time I was advised to buy some bran and shorts, as a great assistant; I bought eight tons, and now my troubles began in earnest. From this time the sheep failed badly, and although fed well and carefully housed, they continued to fail and to look worse instead of better. They had plenty of shed room, about 80 x 30 feet, and a large dry yard to roam about in; still there was a slow but certain decrease in condition; something evidently was wrong. I stopped the bran altogether, as I felt sure that the evil had been accelerated by its use, but continued to feed hay. The sheep began now

to die occasionally, and I became alarmed, and consulted an old friend who was well acquainted with sheep husbandry. He told me all the mischief was caused by feeding bran that had been heated, and that bran so affected generated a species of insect, that would always cause severe illness, if not death, to sheep. It was, of course, too late to stop the cause of the evil, and the only remedy was to divide the flock, and dispose of those that were unaffected. This was done, and the purchaser came and inspected them, and finally selected about 170 of the best, as suited to his trade; all these were at that time perfectly well, but on the whole failing in condition. He stipulated for them to remain on the farm for a month. To this I agreed, and promised to feed hay alone. I did so; and when he came for them, a more wretched lot you never saw. They had become infected by the others, although separate, and were greatly reduced in condition. Sheep at that time were very high, and the buyer still insisted on taking them; the skins he saw were worth \$1 25 each, and he could yet "make well out of them." The sheep were consequently delivered to him, and turned out very badly. I afterwards found that I had narrowly escaped being victimised altogether; and as the buyer did not pay cash for them, the plan was to cheat me out of them entirely; as the purchaser, I afterwards found, was totally bankrupt in credit and means, and he had calculated on getting possession of the sheep, such as they were, never paying for them. However, I fortunately was able to prevent this, and ultimately got paid about three-quarters of the debt, and at even that loss the buyer lost still more money. The remainder of the flock did no good until they could get out in the woods and gnaw the moss and old grass roots, that are always to be found round stumps; after which I lost no more, but all began to mend from that day. To defend the sheep from dogs I adopted a plan that I would recommend to others; it was to procure a dozen large, loud sheep bells, and when a dog appeared, the sheep all ran, of course, and made such a noise that the dog was absolutely afraid to touch them. I never lost one by dogs, but my neighbours all round me lost many.

From this experience I became well aware of a few points in sheep husbandry.

1st. There is a wonderful difference between the well-doing of a flock of thirty sheep, and one of three hundred. The small flock will often do exceedingly well, whilst the large one will fail in health and comparative profit and advantages. I am not prepared to say why this is, but all experienced Canadian farmers will concede this point.

2nd. Sheep will not do so well closed up in any yard or pen, no matter how well arranged it may be, as they will if allowed to roam about and have plenty of air and room. Out of door exercise seems to suit them far better than a yard with but little space to

run about. In Canada, where the winters are long, and the snow covers the ground for many months, sheep are prevented getting at the earth, of which they naturally consume a great deal, and nature seems to require such a medicine or change of diet.

3rd. Bran that is old or has been heated, or has become a little musty, is highly injurious to sheep, and must never be given; it generates some poisonous agent that will often produce severe scouring in the middle of winter. When one sheep is thus affected, the rest will often become infected also.

4th. Any disease that affects one sheep, will infect the whole flock, even when not thought to be infectious.

5th. In many localities sheep will not do well, even with the same care as elsewhere under the same treatment, whereas in some places sheep seem to thrive without any special cause or great care. Of this there is no doubt, and we see it continually made apparent. Adapting the breed to suit the locality will do much to assist; but young sheep farmers must not think because they see sheep doing so well, and costing so little in some places without care, that there is any certainty that their flocks will thrive well under similar treatment.

6th. It is a great mistake to suppose that sheep can do without water, or that they are better without it. It is so far true, as that sheep are certainly injured by drinking water in large quantities at irregular intervals, and many are made sick thereby; but if water is always before them, so that they can drink a little as wanted, they will seldom or never hurt themselves. Watering once a day will not do; they will often hurt themselves by drinking too much when supplied at such long intervals; hence the idea with many people, that eating snow is better for sheep than drinking water. When fed with roots there is no occasion for water; 90 per cent. of such food is water, and is taken in small quantities and often. C.

Experience in Fattening Cattle.

A few days since I was conversing with a very intelligent farmer from Elora, near Guelph, who had followed the stock branch of farming, with great success, for many years, and his opinion is, therefore, well worth recording. Whilst hearing what he had to say, I was forcibly impressed with the great benefit that would be derived if practical farmers would more frequently give the result of their operations to the world, whereby those engaged in similar occupations might have the advantages of their experience.

My friend, Mr. B., began his life in the woods, thirteen years since, with but little capital. The land was fertile and good, but prices low and markets bad. The midge, by destroying his wheat, forced him to raise cattle, and in addition, fatten as many as he

could buy; and he says that of late years he always more than doubles the value of the beast he buys, and has, consequently, a large surplus over the cost of the food. The thirty fat cattle his farm turns out every year leave such a mass of manure, that the turnip ground, in which most of this manure is spread each year, is wonderfully renovated. His theory is, that where turnips are raised, and plenty of manure of good quality applied, three or four white crops may with impunity follow; the last crop again to be followed by an abundant coat of fattening cattle manure, by which a still heavier crop of turnips are grown, and the land never injured. Where possible, he always ploughs in a heavy crop of clover for the following wheat crop—and after wheat, turnips, and plenty of manure applied to force their growth. No doubt this plan leaves the land improved instead of impoverished. The course of feeding he pursues is to give each bullock 80 to 100 lbs. of turnips each day, pulped and mixed with hay, cut not less than one inch long, and one bushel of ground barley a week. When barley reaches 70 cents he feeds peas all mixed together, and he considers them almost as good. He has tried the cooking plan, but does not approve of it, unless where conducted on a very large scale—for a small number of cattle, the cost of heating and cooking the food is quite as great as for treble the number. He never sells any hay, but feeds it all to the stock. He showed me an account of the average cost of four year-old steers, for some years back, and also that of their food. The animal was usually about twelve weeks fattening, and the better it was when tied up, the more profitable it became when sold. It seems the view he takes is this:—A steer that weighs 800 lbs. is worth (if poor beef) about \$3½ per 100 lbs, or \$28 to \$30; now, we will suppose that the same beef when well fattened to be worth \$7, and in the process the animal has grown, say 300 lbs. heavier, and the increased quantity is, of course, as good quality as the rest of the animal. The increase in quality, at the high price of good beef, pays well for the feed and more, and the increased value of the 800 lbs. at \$7 instead of \$3½, leaves a sufficient profit besides the manure. Another view of his was certainly curious, but dictated as the rest, by a vein of good strong sense; namely, if he had no money to buy cattle for feeding, he would feed his neighbours' cattle in his own sheds, charging for the hay consumed \$8 per ton, and for the turnips 6 cents per bushel, and consider himself well repaid for his trouble by the manure left on the premises. His crop of barley always reaches 50 bushels, and of spring wheat never less than 20, and often more than 30 bushels per acre. If he finds a steer not doing well he sells him at once to the first American drover for what it will fetch, to be fed at the New York distilleries.

I could fill several pages with the information derived from this old Irishman. I told

him I should send it to the CANADA FARMER, and he expressed himself rather pleased than otherwise at the idea.

The average cost of his four year-old steers for several years past was \$29 90 each, and the average of each when fat was \$65 50.

Each animal consumes about 1 ton of hay..... \$8 00.
 144 bushels of turnips each at 6c \$ 64.
 12 bushels of barley at 65c..... 7 50.
 Labour of one man to 30 head, say each..... 1 00.

Value of steer when bought..... 29 90.

Average value of each bullock.....\$65 50.
 Manure..... 5 00.

First cost and feeding..... 55 31.

Profit on each..... \$15 16.

This when multiplied by 30 makes the snug little sum of \$451 50 clear profit, and this was based on average prices; sometimes he had only 10 or 15 head, and again at others twice as many. When he bought store cattle and kept them over the winter, he made about as much out of them. Chopped straw, and half the quantity of meal and turnips was the usual allowance; and a steer so fed often realizes \$70 to \$80 in June when finished on the first grass; beef at that time being always very high. The above prices are based on a position where hay cannot be made worth more to sell than \$8. Indeed, if my friend had been offered \$10 for it to take off the farm, I question if he would not rather feed it at \$8 than sell.

To save Young Pigs

Some years since, I was complaining to a friend that my best thorough-bred China sow, always quite fat, and very heavy, lost many of her young ones by lying on them. The loss thus sustained was really serious, especially when we consider each pig so killed worth \$5, of course they were thorough-bred at that price. At my friend's suggestion, I constructed a sty with a bar, 2 x 4 inches, nailed about six inches from the floor, and projecting about six inches from the wall. This bar effectually cured the evil, as it extended all round the sty, so that whenever the sow lay down, whether on one side or the other, the projection allowed the young pig to be squeezed underneath, the back of the mother only coming in contact with the bar. This proved most effective; the little ones were forced under the bar many times, and immediately ran round between it and the wall, to get to the other side of the mother, whereas, had the bar not been there as a defence, the pigs would have been squeezed to death

the mother's back and the wall. I was obliged to squeal lustily enough to get her up before I put down the defence; but the sow, being old and very fat, could not be made to understand that the lives of her young were in danger, and lay quite still to allow the rest of the family to suck. I have rescued the little ones many times in daylight, when I have heard their cries and for that time served their "juvenile bacon;" but in the night no help could come, and out of every ten or twelve pigs the mother rarely raised more than half, until I built the preventive bar above described. I have used this defence for many years, and rarely have any young pigs killed, when large enough to move from directly underneath the mother when lying down.

Management of Young Lambs.

A correspondent of the *Country Gentleman* communicates the following suggestions concerning the management of weakly lambs, and the mode of inducing a ewe to own a strange lamb:—

If, by any accident, a lamb is dropped in some cold, bleak fence corner, or in a snow bank, and is still breathing, although it may be so stiff that the joints cannot be bent, take it to a warm room, put it in a tub in which is water about three inches deep, and as hot as can be borne by the hands; with one hand hold the lamb's head out of water, and with the other rub him all over briskly and pretty hard. As soon as the water feels only warm to the hand you are rubbing with, pour more hot water in, making it feel hot again. Continue the rubbing and pouring in hot water until the lamb puts out his tongue like a heated ox; then take him out and rub him dry with a towel. In nearly every case he will stand on his feet by this time, and if so, put him to the mother and let him suck. If not, lay him in a warm place for an hour or two, rubbing him occasionally.

I have never failed to save a chilled lamb when treated in this manner, even if he was stiff and dead to all appearance, except in occasional slight breathing.

The next thing is to make the ewe own her lamb. All she knows about her lamb is the smell, and washing him is apt to make the sheep disown him. Some old, tame ewes will own any lamb you bring them at such a time, but they are the exception. Young ewes, also, when they first drop a lamb, will often go away and leave him, and if put in a pen with the lamb will not pay the least attention to him, except to knock him over if he attempts to suck.

Take a dish and give the ewe a handful of corn meal. While she is eating it put the lamb into a barrel or box in which there is some corn meal, rub him well all over with the meal, then take him out and rub him with salt from the top of the head along the back to the tail. Now take the dish of meal

away from the ewe and put the lamb under her nose. She will hardly ever fail to taste the salt, and if she tastes, she will usually lick the lamb; then leave her to herself for half an hour, or while she is licking him. I have never known a ewe to disown a lamb if she has once licked him. I have in this way made ewes own lambs not their own, after they had become accustomed to even the voice of their own lambs.

Soiling Cattle

The advantages of soiling over pasturing cattle are thus concisely summed up by Josiah Quincy:—

1. The saving of land.
2. The saving of fences.
3. The economizing of food.
4. The better condition and greater comfort of the cattle.
5. The greater product of milk.
6. The attainment of a greater quantity of manure, of improved quality.

In regard to the crops best adapted for the purpose, their succession, and the time of sowing, the same authority gives the following directions as suitable for the latitude of Boston and any similar climate:—

1. As early in April as the state of the land will permit, which is usually between the 5th and 10th, on properly prepared land, oats at the rate of four bushels to the acre.
2. About the 20th of the same month, sow either oats or barley, at the same rate per acre.
3. Early in May sow in like manner either of the above grains.
4. Between the 10th and 15th of May sow Indian corn, the flat Southern being the best, in drills, three bushels to the acre.
5. About the 25th of May, sow corn again in like proportions.
6. About the 5th of June, repeat the sowing of corn.
7. After the above mentioned sowing, barley should be sown on the 15th and 25th of June and early in July, barley being the best qualified to resist the early frosts.

The first sown will be in a state to be used about the first of July, until which time grass cut and brought to the stable is the reliance.

As soon as the first sowing is fed off, Mr. Quincy recommends that the land be well manured and ploughed, and again sowed with seed, pursuing this practice with all the land from which fodder has been removed in time for a new crop to be grown, which can only be in cases of early sowing.

As to the quantity of land to be cultivated, it is stated that a square rod of rich loam in grass, oats, barley, or Indian corn, is enough to support one cow a day, if cut and fed to her in the barn. But his practice has been to cultivate one and a half square rods for each head, as the season may not be favourable. If there should be a greater growth than is consumed in the green state, it would not be lost, as it may be cured for winter use.

Character of Good Draft Horses

The following was read at a meeting of an English Farming Club, as the points of a good Suffolk horse, by Mr. Henry Crosser:—

A well-shaped head, rather large, a long clean ear, full eye, neck rather long, but not too much arched, strong withers lying well forward to catch the collar at the proper angle for draught, and broad shoulders well spread into the back; back straight, ribs long and well rounded, hind legs bent at the hock, forelegs forward, hind-quarters somewhat round, but not so much so to make them look short; the mane and tail of strong but not coarse hair, and with a fetlock about 2 inches long, broad knees, long hocks, short shanks and hard ankles or fetlock joints, and round hoofs well opened behind; and the nearer you can approach this description, the nearer the horse will be to perfection.

Till the steam plough takes the place of those now used, the plough will always be the work which will wear out the farmer's horse more than any other. Observe your plough-horses on a hard headland, and you will see the horse with very sloping shoulders swerve from his work, where a horse with moderately upright shoulders will lay to his work, and walk straight. I am aware that in these remarks I am touching upon tender ground, for I find the fashion of the present day is greatly in favour of very sloping shoulders. My experience is certainly not in their favour, and Professor Youatt, in describing the farmer's horse, writes that the shoulder should not be too much sloped, as workmen often find fault that a horse jibs when the fault is more in the shape of his shoulder than in his temper, for when he lays to his work the collar catches his windpipe, making him throw up his head and fall back; and when a horse is required to start a heavy load, or take a dead pull, it will be necessary to have horses that will lay to their work, for it is a mathematical certainty that a draught horse must pull from an angle at the shoulder, and if that angle is too sloping, the collar will catch the windpipe, and, if too upright, will press upon the withers. To exemplify the necessity for a staunch horse, allow me to relate an instance I saw a few months since. A waggon was stopped at the bottom of the hill in the parish of Great Fimborough, and when the driver wanted to start his load, three out of the four horses refused the dead pull, and had he not had one with a pair of upright shoulders, he might have stayed some time. On looking round I saw the three were of a favourite breed, and very smart animals, and I also noticed that all three had on collars thickest at the top. This, to me, had a very ugly appearance.

A word or two as to breeding. One point I have found too much overlooked in breeding—viz., hereditary weakness and disease. My advice is, never breed from an unsound animal; particularly do not breed from one

unsound about the feet and legs, for I have frequently been able to trace pedigree by brittle hoofs, and bad ankles or fetlock, for several generations, when acting as judge. I had found too many of our public favourites so very deficient, that even when old enough to put to work, their legs looked half worn out.

Rules for the Care of the Sheep.

We copy the following suggestions about sheep from a circular issued by F. C. D. McKay, the General Agent of the American Emigrant Company. The Company have already over ten thousand sheep scattered among the farmers who purchased land of them, in flocks ranging in size from 50 to 200 head:—

1. Keep sheep dry under foot with litter. This is even more necessary than roofing them. Never let them stand or lie in mud or snow.
2. Take up lamb bucks early in the summer, and keep them up until December 1 following, when they may be turned out.
3. Drop or take out the lowest bars as the sheep enter or leave a yard, thus saving broken limbs.
4. Count every day.
5. Begin graining with the greatest care, and use the smallest quantity at first.
6. If a ewe loses her lamb, milk her daily for a few days, and mix a little alum with her salt.
7. Let no hogs eat with the sheep, by any means, in the spring.
8. Give the lambs a little mill feed in time of weaning.
9. Never frighten sheep if possible to avoid it.
10. Sow rye for weak ones in cold weather, if you can.
11. Separate all weak, or thin, or sick from those strong, in the fall, and give them special care.
12. If any sheep is hurt, catch it at once and wash the wound, and if it is fly time, apply spirits of turpentine daily, and always wash with something healing. If a limb is broken bind it with splinters tightly, loosening as the limb swells.
13. Keep a number of good bells on the sheep.
14. Do not let the sheep spoil wool with chaff or burrs.
15. Cut tag-locks in early spring.
16. For scours, give pulverized alum in wheat-bran; prevent by taking great care in changing dry for green feed.
17. If one is lame, examine the foot, clean out between the hoofs, bare the hoof if unsound, and apply tobacco, with blue vitriol boiled in a little water.
18. Shear at once any sheep commencing to shed its wool, unless the weather is too severe, and save carefully the pelt of any sheep that dies.
19. Have, at least, some good work by to refer to. This will be money in your pocket.

Teaching a Horse to Stop.

When I get a new horse, and that is not very often, I make it my first business to teach that horse to stop suddenly, when I first say whoa; by gently jerking on the lines the horse soon begins to understand you. He should be first taught to stop while walking; then stopped on a gentle trot, and when finally driven rapidly. There isn't a horse in the world that cannot be taught in a day's time to stop, by a short sharp whoa, without drawing on the lines. And they should learn to do this, just as quick as they can. Presently, no matter how badly frightened the horse is, he will stop when he hears the word. Many horses become unmanageable when they get their tails over the lines; so if anything touches their heels, away they go. To a horse properly taught, the word of the driver should be as potent as the strongest lines.

Let me illustrate the value of my suggestions, by relating what I have saved in this way. Not long since, I purchased a spirited young horse, and the first lesson I gave him was to stop when I spoke to him. Soon after, I hitched him into the buggy, and got into it with all my family. I dare not say how many of us there were, lest some of your readers should envy me. Enough, that with what I had at my side, and on my lap, I could scarcely see the horse.

An unlucky whisk of the horse's tail brought the line under it, and quicker than I can tell you, the horse made two sudden bounds, and would have run away, but my timely "whoa," brought everything up standing; and I found the line as fast under the tail as though it were in a vice. The united strength of my whole family could hardly have pulled it out. After standing a moment it came out itself. Then the whole family breathed easier, and the reporters of the daily press lost a good item.

One day my horse and buggy were standing in front of my office, and a heedless expressman drove up with a top waggon, and fairly ran on my establishment. The fluttering of the expressman's curtains, and the rattling of his rickety waggon frightened my horse so badly, that he flew back, tore the bits out of his mouth, broke his hitching strap and started on a run.

Looking out of the window I saw with most indignant eyes the whole transaction. I sprang to the door and spoke a loud sharp "whoa." And though I was some five or six rods from the horse, he stopped as though he had met a stone wall in his road. I breathed easier again, for I had saved fifty dollars or seventy-five, the amount of the threatened smash-up.

Another day, my horse standing hitched, and kicking flies, got his feet entangled and fell down. While struggling to rise the rump strap broke, and feeling himself loose, he sprang to his feet and started on a lively

run with the buggy in the rear. An old farmer gentleman just passing instinctively cried out "Whoa." "My gracious, mister," said he, "I never saw the like of that: why if I had hit that horse over the head with a club, he wouldn't have stopped any quicker. Fine horse, well broken; been one of my horses, sir, your wife would have had plenty of kindling wood. Never stopped a horse that way before."—*Cor. Ohio Farmer.*

To Prevent a Cow or Calf Sucking.

A correspondent sends the following account of a sort of spiked muzzle, a contrivance used often in the old country for weaning calves:—

"A good, simple, and cheap arrangement to prevent cows from sucking themselves, or each other, and which I think preferable to the plan given in your last issue, may be made by making a halter as follows: Take two or three straps two inches wide, and long enough to reach around the cow's nose. Stitch the edges together and the ends also, with sharp nails inserted every $1\frac{1}{2}$ inches, so that the points will stand outward. The heads of the nails should be very large, and should be between the two straps when sewed together. Now fasten two side-straps, with a buckle on one end of one, so that when the part with the nails is around the nose the side-straps may be buckled together over the head, back of the horns; the part around the nose should be large enough to allow the animal to eat freely.

"With this arrangement properly put on, I will risk any cow sucking either herself or any other cow.

"A. YOUNG GREENHORN."

Mr. Ashworth, of Belmont, Ottawa, has sold the bull, The Baron of Belmont, by Sweetmeat (20921) out of the Queen of Belmont, to the Hon. Donald Macdonald of Toronto.

THOROUGH-BRED STOCK.—Major Greig, of Beachville, Ontario, seems determined to take a foremost place in the ranks of short-horn breeders. Within a recent period he has made successive valuable purchases from Mr. McMillan, of Xenia, Ohio, and Mr. Cochrane, of Compton, and other prominent stockmen, and has now made the crowning addition to his herd by the acquisition of perhaps one of the best short-horn bulls on the continent, King of the Ocean, 5165, got by King Richard (26523), out of Fair Maid of Hope. The dam was imported in 1863; she was the first-prize cow in her class at the New York State Fair in 1870. King Richard, the sire, was got by Commander-in-Chief (21451), out of Lady Grateful, imported in 1870 by Mr. Cochrane, at a cost of 1,500 guineas. With such a pedigree this bull cannot fail in the ban is of a judicious breeder to raise the herd into which he is introduced to the very highest pitch of excellence.

Veterinary Department.

Diseases of Fairy Cattle

PARTURIENT APOPLEXY.

In connection with parturition there is a serious disease, which appears to be on the increase in this country, and is known as Parturient Apoplexy, or dropping after calving. It is one of the most serious affections to which the cow is liable, being so rapid in its course, often terminating fatally in a very short time.

It is a blood disease, which is characterized by the great tendency to a congestive state of the blood-vessels of the brain, and also the spinal cord, and frequently involving the sympathetic ganglia; hence the name Parturient Apoplexy, which explains its true nature. It occurs in cows of any breed, and especially such as are good milkers, and in a plethoric condition, apparently arising from the volume of blood not being directed to its proper channel, for the secretion of milk, and being thrown upon the system, producing cerebral disturbances.

Perhaps one of the most noticeable characteristics of this disease is the alarming rapidity with which it is developed, very often attaining its full height in the course of six or eight hours; and it generally appears from the first to the third day after calving, and the earlier it comes on, the more fatal it is. A marked peculiarity of this affection is that it has seldom been known to follow abortion, and generally attacks cows in their prime, when they are in their most vigorous milking condition. It rarely occurs with poor milkers, but attacks those that give a large quantity of milk. No doubt the increased prevalence of this disease in many quarters is due to the increased amount of artificial foods that are used, and with the advance of our agricultural enterprise the aim of owners to keep their cows in very high condition. No doubt good feeding is necessary in dairy stock to obtain good returns, but in some cases it is carried too far, and disease and death are the result.

The symptoms of this fatal complaint are unmistakable. After calving the cow does not give her natural quantity of milk, and the yield gradually diminishes at each milking, and for a short period there may not be any signs of pain or fever, but soon the eyes look dull, she staggers in her gait, appears weak in her hind legs, and drops to the ground, and perhaps makes a few ineffectual attempts to rise, the secretion of milk becomes impaired, or altogether arrested, the bowels are unmovable, and the urine retained within the bladder, the eye appears perfectly fixed in its socket, the mouth, ears and horns are intensely hot, the pulse is quickened and the breathing laboured; as the cerebral symptoms become more developed, the eyesight is perfectly gone, the nerves of vision

are paralysed, producing a widely dilated pupil, the head is turned backward over the shoulder, and perhaps raised for a little and dashed violently to the ground. There she lies moaning and perfectly insensible to all surrounding objects, the pulse becomes almost imperceptible, and if you raise the head it will fall like an inanimate body, the legs are cold, and accordingly there is a tendency to convulsions followed by complete prostration; she lies without the slightest power of motion, all sensibility gone, and death may occur from twenty to fifty hours from the beginning of the attack.

Parturient Apoplexy, as already mentioned, is very fatal, and when the alarming head symptoms are shown, its treatment is very unsatisfactory.

The treatment must be energetic. In the early stage, before there is complete loss of power, we strongly recommend blood letting. Six or eight quarts should be abstracted, but it must be done in the early stage of the disease; when coma and paralysis have supervened bleeding is not attended with benefit. A full dose of purgative medicine should be administered without delay, as a pound to a pound and a half of epsom salts dissolved in two or three quarts of water. Apply ice to the head, and cover the body warmly. An enema of soap and water, to which may be added two ounces of spirits of turpentine, should be given every two hours; and it is frequently necessary to use the catheter in order to relieve the distended bladder. The liquor ammonia should be given in two or three drachm doses, largely diluted with cold water, and repeated every three or four hours. The limbs and udder ought to be well hand-rubbed, and the teats should be drawn often; the spine may also be rubbed with mustard; and the general comfort of the patient should not be neglected. Great relief is afforded the poor sufferer by turning her over from one side to the other, and by supporting the head in an elevated position by means of bundles of straw.

In this disease medicines must be given with great care; for when the comatose symptoms are coming on there is a difficulty in swallowing, and the drench if too quickly or too forcibly given may partly pass into the larynx and trachea and produce suffocation. Many persons have seen cows suddenly die with symptoms very like those of asphyxia immediately after the careless and forcible administering of medicine, and there is no doubt that many animals are so destroyed.

When the comatose condition is fairly established it is almost an impossibility to give medicine without the aid of a stomach pump, and in very many cases it is better and safer to persevere with the external applications, and the free use of medicated clysters and avoid the risk of suffocating your patients. We have endeavoured to point out the causes and treatment of this very serious and fatal mal-

ady, and are confident that with judicious management it can be prevented, which is a great deal more satisfactory than treatment.

As a matter of course, every stock owner and every attendant upon dairy stock has a natural desire to keep the animals under his care in good condition, not only for the sake of appearances, but with the view of increasing the secretion of milk. Now, it is the amount of food that is given to cows before parturition and immediately afterwards that produces the disease; it is wholly the result of the full or plethoric state of the system, and this state can be counteracted by very simple and safe means. For eight or ten days before calving the animal should only be allowed a limited quantity of food, and after parturition the food should also be restricted for some time; it can be gradually increased after four or five days, and when the secretion of milk is taking place in a regular manner. No doubt the cow, for a short period, would not yield such a quantity of milk as if she was highly fed, but the temporary loss would be amply counterbalanced by escaping the dangers of parturient apoplexy. When an animal is in excessive condition, a few doses of laxative medicine may be given, but in the majority of cases restriction of the diet will have the desired effect.

MAMMITIS.

The udder, or mammary gland, of cows is very liable to disease. It often becomes inflamed, and the condition is known as mammitis, garget, felon, &c. This affection proves very troublesome, from interfering with the function of the udder, either temporarily or permanently. It may attack the whole organ, or be confined to one quarter. It occurs in two forms; in the one the inflammatory process is situated in the mucous membrane and skin covering the gland, which feels hot and tender, and also reddened and swollen. There is fever, as is indicated by the dry muzzle, hot mouth, and quickened pulse. The animal may suffer pain and distress in progression, and one of the earliest symptoms is lameness in one of the hind legs. The milk is curdled, and mixed with streaks of blood, showing that an acid secretion has been formed. Not unfrequently an abscess forms in the gland, followed by profuse suppuration, completely destroying the structures of the part.

Mammitis may be caused by improper milking, as irregularity in the time of milking, or from sudden changes of temperature. In the months of August and September it is common, and produced by the heavy dews during the night, and the hot weather in daytime, and it often results from exposure to wet or cold, and from mechanical injuries, as blows, or injuries from other cows.

If attended to in the early stage, and proper remedies applied, the symptoms are easily allayed. When occurring during the hot season, the udder should be fomented

with warm water three or four times a day, and well dried and hand rubbed, and a good dose of purgative medicine given, as half a pound to a pound of Epsom salts. The heat and moisture, to be of benefit, must be continued, and an easy and effectual method is to apply a cloth over the udder, leaving holes for the teats, and secure it by means of a bandage around the body. The udder can then be covered with wool or tow, which should be kept moist by renewed application every hour. The teats should be drawn regularly every four hours, and when milking is attended with great pain, the syphon should be used. It is a very simple instrument, and every owner of cows should have them on hand.

The cow should be kept in a comfortable place, and the diet should consist of bran mashes, or of a small quantity of green food.

In cold weather, unless the animal is kept in a very warm place, hot fomentations are seldom attended with any benefit; therefore, instead, we would recommend the udder to be rubbed several times a day, with a mild camphorated liniment, and the body should also be well clothed. Many other remedies can be resorted to, but those have been mentioned that can usually be readily procured, and when resorted to will frequently check the progress of the disease. Blisters and irritant dressings we do not recommend, as the most desirable results can be accomplished by these safe and simple remedies.

WARTS.

The teats are very liable to warts and other abnormal growths, both externally and internally, and although they are not attended with any serious consequences, yet they often create an irritation and suffering that may impair the secretion of milk, and also render the operation of milking difficult to perform.

When situated in the inner part, they may be felt on compressing the teat between the finger and the thumb, and can be removed by means of a silver probe, or by the concealed bistoury, but in doing so no unnecessary violence should be used, as inflammation might be set up in the quarter.

When forming externally, they can be removed either by the knife or ligature, and dressed with a mild caustic, afterwards applying morning and night, immediately after milking, a small quantity of sulphate of zinc ointment, about the strength of one drachm of sulphate of zinc to two ounces of lard.

STRICTURE OF DUCT.

Many a valuable cow becomes, comparatively speaking, worthless from stricture of the duct, which may diminish or completely stop the flow of milk. The stricture is often brought on from exposure to cold, or it may be caused by growths or tumours irritating the mucous membrane. Frequently, in young cows, the opening of the teat is not

sufficiently large to allow the milk to flow freely, and the force required to draw the milk from the quarter may induce disease.

Many of these cases can be relieved by the use of the concealed bistoury, which can be safely introduced into the teat, and the duct enlarged.

FOOT AND MOUTH DISEASE.

As already mentioned, considerable alarm has lately been created in the State of New York, from the appearance amongst the cattle in various districts of a disease called Foot and Mouth Disease, and it has also been stated that the malady had been introduced through the medium of Canadian cattle going directly from Canada.

We have no hesitation in saying that the disease in question is altogether unknown among the cattle of our Province, and if they have it in the neighbouring Republic, in all probability it has been imported directly from England.

It may not prove uninteresting to notice briefly the nature and symptoms of this complaint, as some of them are somewhat similar to other affections that are not of a contagious nature.

The name Foot and Mouth Disease is applied from the symptoms developed in the mouth and about the feet. It is also called epizootic aphtha, exema epizootica, murrain, and so forth.

Epizootic aphtha is an eruptive fever attacking the ox, the sheep, the pig and the horse. It is highly contagious. It first appeared in Britain about thirty years ago, and it is doubtful if that country has been entirely clear of it since that period. Long before that time it was noticed on the continent of Europe, which appears to be the hotbed for epizootic diseases of a contagious nature.

In 1861 it prevailed to an alarming extent in England, and during the past year it has again broken out with increased virulence. According to the *Veterinarian* of December, in the month of October there were over 3,000 centres of infection in Britain.

Epizootic aphtha is a disease that is easily detected. It generally begins with a shivering fit, after which there is a marked dullness, a staring coat, and an increased frequency of the pulse. The temperature of the body is increased, which can be readily detected by a small thermometer introduced into the mouth or rectum; the appetite is impaired, and there is a discharge of saliva from the mouth, of aropy, sticky nature; rumination is suspended, and the animal quits its food; there is lameness in the feet, and small vesicles appear between the divisions of the foot, and also around the coronet and the whole secreting structures may be so severely inflamed as to lead to casting of the hoofs. Vesicles also appear on the mucous membrane of the mouth, and on the tongue. These vesicles vary greatly in size, and they soon burst and discharge their con-

tents, and the whole mouth presents an ulcerated condition, giving the animal great pain, and rendering it unable to masticate its food. In some cases there is a peculiar smacking of the lips. In milk cows these vesicles also appear on the udder and teats, and are usually well raised, and soon burst and discharge a clear fluid.

In this disease the period of incubation varies from two to four days, and in most cases the fever subsides in about four to six days after the prominent symptoms are developed; and in ten to twenty days the animal will be convalescent.

Animals when so affected soon lose condition, and when the disease occurs in dairy cows the milk is unfit for use, but otherwise it is not a severe disorder, and is anything but a fatal complaint. The other day we noticed an account of cases in an English paper, and out of 7,429 cases, only eleven had proved fatal, a very small percentage of deaths.

In the treatment of epizootic aphtha good nursing and cleanliness are the essential remedies.

The laws regarding contagious disease in Britain are very rigid. Wherever an outbreak occurs, it must be reported to the Inspector of the District, and no animals are allowed to be removed from that part until all signs of disease have disappeared.

It is to be hoped that the disease will not be introduced into this country. If it extends to the States, we are also in danger; and even in the importation of stock from England, great care should be taken in the transportation of such animals.

Rheumatism in a Colt

To the Editor.

SM.—We have a colt which was foaled last June. It was very smart until a week old, and then began to show a slight stiffness in the loins as it moved. Thinking it a cold, we stalled it at nights and during rain storms for some time, but finding no relief we turned it out. The stiffness increased a little until December, and remains about the same. When stepping up or down a foot high or so, it throws itself sideways. It gallops with the other colts, but cannot kick. It is apparently in good health, and has a good appetite. The dam and sire are both sound.

A SUBSCRIBER.

REPLY.—Judging from the symptoms mentioned, the case is probably one of rheumatic inflammation of the joints, and very likely the stifle joint. We would advise you to keep the colt in a comfortable box, and allow plenty of clean straw, and at the same time give him a generous diet. The stifle joint may be stimulated once a week with a mild tincture of cantharides.

COLLAR GALLS.—N. R. asks what is the best treatment for sore shoulder on a horse. Collar galls are frequently very difficult to remove. We would recommend rest, or, at all events, keep pressure off the injured

parts, and dress daily with carbolic lotion, one part of carbolic acid to ten parts of water. In some cases it is necessary to cut out the diseased part, before the healing process is established. Some fault in the fitting of the collar is usually the cause of this troublesome ailment.

LARVA OF GADFLY.—The grubs referred to by a correspondent as "appearing on the backs of cattle in the spring" are the product of the gadfly (*Stratus borealis*). The ova or eggs are deposited on the back or other parts of the body during the months of autumn. It is rare that they are productive of any great harm.

SKIN DISEASE.—The specimens of scales sent us by a correspondent are apparently merely the peeling off of the cuticle, or scarf skin, which may occur from various causes, as exposure, a debilitated state of the system from mange, or ringworm. Therefore, from the description of the symptoms only, we are unable to distinguish the precise disease in the cases referred to. However, in removing any such irritation, good feeding, cleanliness, and dressing the parts every second day with carbolic acid lotion, will be found beneficial. The lotion may be applied in the proportion of one part of the acid to thirty parts of water.

"BLOWN" OR TYMPANITIS IN CATTLE.—A correspondent wishes to know the proper treatment for cattle that are "blown." The preparations of ammonia are the most effectual remedies in severe cases of tympanitis, and the preparation known as *aqua ammonia*, or hartshorn, can generally be easily procured. The dose is from three to four drachms, and must be given largely diluted with cold water, or combined with cold gruel or maulage. After an acute attack of tympanitis it is often advisable to give a small dose of purgative medicine, as four ounces of epsom salts dissolved in a pint of water, and the diet should be restricted to easily digested food for a few days.

LARD AS A REMEDY.—"A constant reader" sends the following statement and query: "During the past summer I was called to see a ewe, which I found in a field almost dead. The disease, to all appearance, was staggers. I opened a vein, but found that it would not bleed. I then melted lard, and gave it a cupful, and it died. About a month ago a valuable ewe of my own became sick, and after watching it closely for several hours, I concluded the trouble was staggers, and on referring to my book, found melted lard given as a remedy, and I administered about half a pint and the ewe died immediately. Query, is melted lard a proper remedy for staggers, and if so, are sheep subject to any other disease that could be mistaken? It is possible that in the comatose or insensible state of the animal the lard might have passed into the wind-pipe, otherwise it alone would not be likely to produce any serious injury.

The Dairy.

Dairy Farming.

MANAGEMENT.—Cleanliness in the cow-house, in the dairy and in the dairy manager, is the *summa bona* of successful cheese and butter making.

The cow-house should be warm, dry and well ventilated. The proper temperature at which to keep a cow-house should be 60° in summer, and as near to 40° in our winter as possible. It is not advisable to keep our cow stables too warm, for the contrast to the cold in the outer air of this climate would be too great, and would be injurious to our cattle. Our bank barn stables are excellent institutions, but I have often found them much too warm for cattle, and there is a most utter disregard of proper ventilation in the majority of such byres. Instructions have been so often given in the CANADA FARMER for the construction of suitable byres, that it would be superfluous to enter into that part of the subject at more length.

In Holland, where dairy farming forms a very prominent object in the husbandry of the farm, many of the wealthy farmers have their common parlours entering by a glass-door into the cow-house, which is regularly swept and sanded to a state of the most extreme tidiness, and the animals are not only wiped and curried as we would a horse, but thier tails, after being nicked, are sometimes tied up in pulleys to prevent their soiling themselves.

The feeding of milch cows is a most important subject, upon which immense differences of opinion exist. In Canada, owing to grasses being confined to two kinds, we have little choice of food in summer, unless we adopt the soiling system. In winter, milch cows will do well upon sweet oat or barley straw, if accompanied by a liberal supply of succulent roots.

Of course, if we would keep the full supply of milk, hay is far preferable to straw.

The relative value of mangold wurzels and swedes is of little consequence in winter feeding, the advantages derived from their use are chiefly due to the benefits of a change of food.

Milch cows require a certain amount of exercise at all seasons. From the fact that the formation and secretion of milk has been shown to take place chiefly while the animal is at rest and chewing her cud, it has been argued that it were better to keep our cows tied up during the whole of the winter season. But as we have to consider, not only the actual secretion of milk, but also the general healthiness of the animal, it is absolutely necessary that we allow them exercise, although in the winter such may be confined to a liberty of two hours each mild day in a well sheltered barn-yard. Towards the spring, animals exhibit that same desire to enjoy the bright change of season that we

ourselves experience. This should be encouraged, and though there be no pasture, cows should be allowed a daily run, without stinting them in their dry food. The transition from hay to grass should be gradual, and they will thus escape the enervating influences of a too sudden change of diet.

C. E. W.

Cheese Factories

We have repeatedly received letters of enquiry respecting the details of a cheese factory, from parties contemplating the starting of such an undertaking. We have in former issues given the information asked for, and would refer our correspondent to an article on the subject, having special reference to small factories, in the December number of the CANADA FARMER. We now publish, as the best answer we can give to such correspondents, a communication from Mr. Willard, furnished by him to the Royal Agricultural Society of England, and which concisely covers the whole ground:—

“There are very few factories where the milk is purchased by, and the business carried on wholly under control, of one or more proprietors, thus making it a separate and distinct interest from that of patrons.

“The popular method of organizing factories, and one which seems to give good satisfaction, is to make them joint stock concerns. The ground is selected and an estimate made of buildings, machinery, and fixtures. The whole cost is then divided up into shares of fifty to one hundred dollars each, and the neighbouring farmers, or those favourable to the movement, take stock in proportion to the number of cows from which they are to deliver milk. Officers are chosen and the company managed as a joint stock company. Usually a committee, or some one person selected from the patrons, is chosen as salesman of the cheese. His duty it is to make sales at best prices to be had, arrange dividends, and pay over shares to patrons, deducting of course the price per pound for manufacturing, which is made to cover all expenses, including the per centage on cost of buildings and fixtures.

“A good cheesemaker is employed as manager and manufacturer at a certain price per pound of the cheese manufactured. This manager employs his labourers or assistants, and pays all expense of running the factory, taking care of cheese, keeping record of milk delivered daily by different patrons, entering the same on the books of the factory and upon the passbooks of patrons. Often the company employ the manufacturer and all the hands at fixed salaries.

“The milk is weighed at the factory when delivered, and as experience has shown that every ten pounds of milk (as an average for the season) should make one pound of cured cheese, firm, solid, and in good marketable condition, each farmer thus has a

daily record in his passbook of what his herd is yielding.

“The manager is employed with the understanding that he is to make a good, fair article, and his product is examined from time to time by committees, by experts, and by patrons, as they see fit, and thus bad work is soon detected. If the management is not satisfactory the cheesemaker is discharged or the causes of the bad work traced out and rectified.

“The stockholders and those delivering milk meet from time to time and deliberate as to sales, each one voting according to the number of cows from which he delivers milk, and in this way instructions are issued to the salesman.

“Then there is another method of establishing factories. One man, or a company, erects buildings and is to all expense in running the factory, charging by the pound of cured cheese for manufacturing. The cheese in this instance, it will be seen, belongs to patrons, who appoint a salesman and control the product precisely as under the other method.

“It will be observed that under this system of checks all men who deliver milk are upon an equal footing, where no advantage can be taken, for the farmer, if he chooses, can weigh his milk at home and compare it with the figures entered at the factory upon his pass-book. The company is responsible for milk delivered. The account is payable in cheese, this part of the system being somewhat like that in making deposits at bank.

“1. *Number of cows (average).*—The number of cows varies greatly, from 300 to 1,500 or more. Our experience shows that a factory with less than 300 cows will not pay expenses, including interest on capital invested in factory, fixtures, &c., unless an extra rate be charged for manufacturing. Extremely large factories, say of 1,500 cows, do not give the best return to farmers. There is usually more waste; the milk coming from a long distance is often in a bad condition, and the work at the factory is, from time to time, hurried and slighted. The best results are obtained, both as to quality and quantity of product, where the factory uses the milk of from 500 to 800 cows, and not above 1000.

“*Size of buildings.*—Improvements are constantly making in buildings. The early factories were made rude and imperfect structures. The late erections are more substantially built, but very plain in style, with no pretensions to architectural beauty. This is a mistake. A competent architect should be employed, who should give designs for a handsome exterior, imposing, graceful and pleasing to the eye. The cost would not be very much more, but the value of such buildings would be greatly enhanced, and could be turned to good account in case they were abandoned for cheese making.

“In some of our establishments the manufacturing department and curing rooms are under one roof—in others they are separated. The system of marketing cheese in America is somewhat different from that in England. The cheese is not held for so great a length of time while curing. We try to send our cheese to market when it is from thirty to sixty days old. There are few curing rooms built with the design of holding cheese for the entire season.

“Without attempting to give model buildings, or those considered by some as the best, it will perhaps suffice to present two or three plans of those esteemed as among the first-class.

“The Fairfield and the Willow Grove factories send out cheese favourably known in the English markets. They have for several years received ‘top prices’ from English shippers.

“The Fairfield factory is located in Herkimer Co., N. Y., eight miles from Little Falls, the largest country cheese market in America. It receives the milk of 1,000 cows. The manufacturing department and curing-rooms (‘dry house’) are under one roof. The establishment is one hundred and forty-eight feet long by thirty-eight feet wide, and three stories high. The second and third stories are for curing-rooms. The manufacturing-room is forty by twenty-eight feet; press room, thirty-five by thirty-one feet. The boiler, five-horse power, stands in a separate room, and cost four hundred and fifty dollars. The manufacturing room is provided with double vats for cheese making. These vats are each sixteen feet long, three feet four inches wide and eighteen inches deep, holding six hundred gallons.

“We may remark here that vats of this size and proportion are convenient for work, and are usually adopted at the factories. They are double—that is, the inner one of tin setting in a wooden vat, with spaces between the two at the sides and bottom where the heat is applied, either steam or hot water.

“The Willow Grove factory is in Oneida county. The dry house sets upon high stone piers, and is one hundred by thirty feet, two stories. The manufacturing department is in a separate building, being thirty by twenty-eight feet, with press room twenty-six by fourteen feet. The factory has capacity for the milk of 1,000 cows.

“Wight’s Whitesboro factory, in Oneida county, has also a high reputation in the English markets. It was erected for six hundred cows. Dry house one hundred and four by thirty feet, two stories. Directly opposite stands the manufacturing department, which is twenty-six by fifty feet.

“3. *Cost of Buildings.*—This, of course, varies in different localities, and must be regulated according to taste in architecture, cost of material, labour, &c., &c. Factories in the State of New York cost from \$3,000 to \$10,000.

"4. *Cost of Machinery.*—The principal cost under this head will be for steam boiler, milk vats, presses and hoops. Steam boiler, with fixtures, say \$500; vats, \$100 each; screw presses, \$4 each. A factory for six hundred cows may be fitted up in good running order for from \$1,200 to \$1,500. Vats with heater attached, which will obviate having steam boiler, are sold (six hundred gallon size) for about \$200 each.

"5. *Capital Invested.*—If ground or factory site be added, this question is answered in Nos. 3 and 4. Sites for factories are often leased at small rentals, and for a series of years.

"6. *Work People Employed.*—A factory with six hundred to eight hundred cows will need five hands, and perhaps, when the curing rooms are full, more help. The manufacturer or head manager, if skilful, will command from \$800 to \$1,200 and board, for the cheese making season, nine months. The second man, who, perhaps, has worked at the business for a year or more, gets, say from \$35 to \$45 per month and board, and women from \$4 to \$5 per week and board.

"Women not unfrequently take charge of factories as head manufacturers at salaries as high as \$100 per month and board. Boys and girls, or young persons of immature age, are not usually employed. The head manufacturer at the factory is expected to 'take off his coat' and do a good day's work every day, seeing to the delivery of the milk, working at the curds, the presses, and with a sharp eye to see that all moves on in order and on time.

"*Quantity of Milk Received.*—This, of course, must depend on a variety of circumstances—goodness of cows, quality of pasturage, the season, time of commencing and closing operations.

"The Weeks factory, at Verona, Oneida county, in 1867 had an average of 640 cows; length of season, 209 days; pounds of milk received 2,481,615; green cheese made, 261,904 pounds; cured cheese, 250,510 pounds; shrinkage, four and one-third per cent; pounds of milk to green cheese, nine and forty-eight one-hundredths; pounds of milk for cured cheese, nine and ninety-one one-hundredths.

"The gross receipts per cow (average for the season exclusive of income from butter and cheese, made before the factory was opened and after close) varied from \$64 to \$78, the former being the poorest dairies and the latter the best.

"The cheese sales in 1867 were very low in America, the average at the Weeks factory being only \$14.40 per one hundred pounds. The receipts other years have been very much larger, but it is always well to estimate of this kind to keep on the medium side. Some of the factories in Herkimer county make an average of five hundred pounds to the cow, and at present prices for cheese (twenty cents,) this would give \$100

This would not be a fair estimate, however, for a novice to base dairy prospects upon.

"8. *Distance (maximum and average) which the Milk is Brought*—The average distance from which the milk is brought will not exceed one and a half miles, and perhaps in the old dairy districts in New York a little less. Four or five miles may be set down as the maximum except in rare cases, as at the West, where we have reports of milk being carted eight miles and more, and yet, if cooled at the farm, arriving at the factory in good condition. Such a long distance is regarded as altogether too far to cart milk with profit, especially on our American roads which for the most part are bad during a considerable portion of the year.

"The practice of cooling milk at the farm does not usually obtain among dairymen. Canning milk too warm and hauling it in this condition to the factory, results in great losses to the American dairymen. It is now several years since we commenced urging upon our dairymen the importance of cooling the milk at the farm and as soon as drawn from the cow, and, most especially, have we urged this principle since returning from a visit to European dairies.

"In 1866 the American Dairymen's Association employed the writer to go abroad and make a careful examination of European dairies, and to report upon their management. After an extended observation over the dairy districts of Great Britain, and an examination of the English methods, it was clear that in a matter of cleanliness, care of milk and of stock, management of pasturage, &c., the English were in advance of us; but in machinery and appliances for manufacturing the Americans were a long way in advance of the English.

"Our reports upon English methods, &c., have effected a great change in American dairy practice, and it is pleasant to know that the bad practices of our dairymen are being corrected. We are now beginning to cool milk at the farm, and it need not be said the character of American cheese has greatly improved.

"As to our factory system:—Uniformity and excellence of product is almost always certain where good milk is delivered at the factory. The machinery and appliances for manufacturing render cheese making comparatively easy. Everything is so arranged as to avoid lifting and heavy work. The manufacturer must exhibit high skill in manufacturing. He makes cheese making a study and adopts it as a profession, and a good salary is paid for skilled service, which induces greater efforts for success, and hence constant improvement is going on.

"9. *Pounds of Cheese Made per Annum*—This has been answered under previous heads. We may remark however, that a little less than ten pounds of milk is considered a fair average (the season through) for one pound cured cheese. Some skilful manu-

facturers will get an average of one pound cured cheese from nine pounds milk, and some report even better than this.

"10. *Charge of Making.*—The usual charge in large factories is seventy five cents per one hundred pounds of cured cheese. This includes care of cheese until sold. If the factory is small one cent per pound is charged. A large number of factories charge two cents per pound, and furnish everything required—bandago, annatto, rennet, and the boxes in which the cheese is placed for shipping. Hauling cheese to railroad depot is done by patrons.

"11. *Disposal of the Whey*—The whey is usually fed to hogs at the factory. Ample pens and yards are provided by factories. Each farmer delivering milk is allowed one hog at the factory for every five cows. He can have a pen where he can keep his hogs separate from others or turn them in the yard with others. Then whey runs to large reservoirs near the pens, and when the hogs are to be fed a faucet is opened which lets the whey into the troughs.

"At some factories the whey is carted home by farmers when they return after delivering milk. Quite recently a process has been invented for taking the butter from the whey—or rather two processes, the hot and cold.

"In the hot process the whey is run off sweet from the curds into a large copper vat placed over an arch. Heat is here applied to the whey to a temperature of one hundred and eighty degrees. Acid (sour whey) is added also. The oil and albuminous matter quickly rises, is skimmed off and set in a cool place. The next day it is churned at a temperature of from fifty-six to sixty-eight degrees. About twenty pounds of butter is thus obtained from five hundred gallons of whey. The butter is of good colour, and when the process is properly conducted, of fair quality for present use.

"We have seen and tasted of samples that could not readily be distinguished from butter made from cream, and it sold to butter dealers in the market at the same price with other butter.

"At some of the factories the whey is considered a requisite of the manufacturer, who purchases hogs and feeds them upon it.

"It should be remarked that when the butter is taken from the whey as above, the whey is then used for feeding swine. It is fed sweet, and in practice it is claimed the pigs thrive upon it quite as well as when fed in the usual way."

Milk and Cow Fairies:

The *Milk Journal*, a new periodical devoted to milk, butter, and cheese, recently commenting on the quality of milk, shows that the density or specific gravity is not, as was formerly understood, a safe criterion of the goodness of milk. When kept even in a close

vessel for two or three days, the specific gravity of milk "falls in a very remarkable manner." According to the *Journal*, milk, when kept for two or three days, often becomes actually lighter than water. This curious fact is somewhat difficult of credence, since milk contains about 10 per cent. of solid matters. If correct, the great diminution in specific gravity can only be accounted for by some molecular changes in the milk, and perhaps by the evolution of gases. Some similar changes in density also occur when milk is shaken by transport. It is an important sanitary question, whether milk which has undergone such changes is safe food for men or animals? For young or delicate animals, or even milk which has been transported a distance of several miles, is often found to be injurious, producing readily acidity, and proving otherwise difficult of digestion. The shaking of any considerable journey appears so to change the relation of the constituents of the milk to each other that the curd does not afterwards properly separate from the whey, nor does the cream rise, as in fresh milk, to the surface. These changes are delayed when the milk, as is common in America, is rapidly cooled down so soon as it is drawn from the cow.

On "country versus town milk," Professor John Gamgee recently read an instructive paper before the association of the medical officers of health. He pointed out, on the authority of Dr. W. Taylor of Perth, Dr. Bell of St. Andrews, and Dr. Ballard, that scarlet and typhoid fevers have been propagated by milk. Foreign diseases amongst dairy cows, and probably the contagious pleuro-pneumonia, have been a sad blow to town dairymen, who in their palmy days sometimes kept several hundred cows; one Mr. Biggs is mentioned who owned 999 cows. Three years was wont to be the average duration of a town dairy cow's life; of late years it has often fallen to as many months. Professor Gamgee remarks that so rife and serious has been disease in town dairy stocks, that a dairyman whose standing stock would never exceed fifty, has had during the year to buy a hundred cows. With such frequent changes, the risk of bringing into his stock fresh contagion is greatly increased. A good deal of meat from cows in various stages of disease finds its way, in spite of market inspection, into consumption. Various disorders in the human subject are thus apt to be engendered. Professor Gamgee discounts the keeping of cows in towns, where they occupy valuable space, absorb aerial food required by human beings, and even when well attended to give rise to various nuisances.—*North British Agriculturist*

The Ayrshire cattle are now attracting some attention in the Western States. Dairymen are looking to them for improving their stock for dairy purposes.

Entomology.

The White-Marked Tussock Caterpillar.

Mr. Wm. Simpson, of Amabel, Ont., writes as follows:—"I found a large number of the enclosed on my apple trees, always in sheltered positions on the branches late in the fall, in going around my orchard to-day, for the purpose of seeing if I had left any, I found a few, so I thought I would send you a sample. Are they injurious to the trees or fruit? If so, what is the best method of getting rid of them? I picked all I could see off my trees and burned them. By taking notice of this communication you will oblige my neighbours, as well as myself."

The specimens enclosed in the above note were two empty cocoons of the White-marked Tussock Caterpillar (*orgyia leucostigma*, Smith and Abbott). These caterpillars are destructive to the foliage of the trees, and consequently are injurious if they are allowed to become numerous. Our correspondent has already adopted the best and simplest mode of preventing them from committing any ravages in his orchard. The following account of the insect, taken from our recently published Report on Insects Affecting the Apple (*First Annual Report on the Noxious Insects of Ontario, by B. Thune, Smokers and Reel, 1871, page 82*), will probably afford Mr. Simpson and his neighbours all the information they desire.

"During the winter, when our apple trees ought to be destitute of leaves, we occasionally see a single leaf or cluster of leaves attached to a twig. If these are examined they will in almost all cases be found to contain an old grey cocoon, and the greater number to have a mass of eggs, covered with a white, glistening, froth-like substance, attached to them as well. These eggs, two or three hundred of which may be found upon a leaf at once, are the first stage of the White-marked Tussock Caterpillar, or as Dr. Fitch styles the insect, the American Vapourer Moth (*Orgyia leucostigma*, S. and A.). Each egg has a deep hollow on the top, giving it the appearance of a tiny opaque white bead. The caterpillars which come out of these eggs in the early part of summer—the end of May or beginning of June—are remarkably pretty creatures. When full grown they are over an inch long, of a bright yellow colour, with thin yellow hairs along the side of the body; the head is bright coral red, the next segment has two long pencils of black hairs projecting forwards; and the last segment but one, a single similar pencil pointing backwards; on the fourth and three following segments there are short thick brush-like tufts of yellowish hairs; and on the ninth and tenth two little coral-red knobs or warts.

"These caterpillars feed singly on the leaves of apple, plum, and a large number of other trees; sometimes, when they are numerous,

doing a good deal of damage. When full fed they spin their thin silken cocoons on twigs of the trees which they frequent, or on fences; in the former case they draw down a leaf as a covering, and firmly attach it to their cocoon. The male cocoon is white, or yellowish, and so thin as to show the insect through it; but the female cocoon is twice as large and much more firmly constructed, and contains also a different shaped and much larger chrysalis. The insect remains about a fortnight in the chrysalis state, and then comes forth in the form of a moth. The male has broad ashen-grey wings, which expand about an inch and a quarter; the fore-wings have a few indistinct black lines across them, and a white crescent-shaped dot near the lower corner; the antennæ are broadly and beautifully feathered, the tips of the plumes bending forward and approaching each other. The female, on the other hand, is extraordinarily different, and would never be suspected of laying claim to the title of moth; she has the merest rudiments of wings, which are not observable except on close inspection, and thin simple antennæ; in fact she is more like an animated bag of eggs than anything else. Being unable to fly, she remains on her cocoon, where she is found by her mate, whose boastful ostentatious flight is the origin of the English name "Vapourer." After pairing, the female lays her eggs upon the cocoon, covers them with the curious frothy matter, which becomes hard and brittle and protects them from the weather, and then—her work accomplished—drops down and dies.

The best remedy for these insects, when sufficiently numerous to be troublesome, as they often are, is to go round the orchard during the winter, and take off all the cocoons that have eggs attached to them. They can be at once discovered by their attendant withered leaf. Those that have no egg masses on them should be left, Mr. Riley recommends, as they either contain the empty male chrysalis, which is harmless, or some friendly parasite. This work can be accomplished at the same time as the search for the egg brackets of the Tent-Caterpillars is carried on."

Earth-Worms

T. H. P., Woodstock, Ont., wishes to know whether salt will destroy earth-worms in a lawn, and if so, what proportion per acre should be employed; or whether there is any remedy for these creatures.

These are enquiries that we feel rather unwilling to reply to, as we have always regarded the earth-worm as a good friend to the farmer and gardener, rather than a foe. It is certainly a most important and serviceable agent in loosening the soil and opening it for the air and water to penetrate; while, by throwing out its castings at the mouth of its burrow, it adds to the depth of the soil, and gradually covers tracts that are comparatively barren with a superficial layer of fine fertile mould. Mr. Darwin—no mean authority—gives an instance of its work in

this respect. He relates that a pasture field, left undisturbed by the plough, had received a heavy top-dressing of lime twelve years, and of cinders three years previously; on examination lumps of lime were found, forming a well marked white line at a uniform depth of two inches below the surface, and at the depth of one inch was a line of black spots formed by the remains of the cinders, the soil below the white line being gravelly, and differing very perceptibly from the fine mould above. This deposit of earthy matter heat-tritutes almost entirely to the work of the earth-worm in bringing up its castings to the surface.

These worms appear to have their principal habitation at a depth of about a foot, or a little more, below the surface, and there, when the soil is rich and the creatures are numerous, the earth is completely mined by their burrows, which extend in every direction, like a labyrinth. On these grounds, then, we consider the earth-worms to be eminently beneficial, enriching the soil and rendering it loose and porous by their minute system of underdrainage.

As, however, they do occasionally give trouble by their attacks upon fallen fruit, vegetables and plants, and as our correspondent wishes to get rid of those infesting his lawn, we may quote the remedies mentioned by Mr. Curtis in his great work on Farm Insects: "A solution of salt and water will destroy worms, as will also corrosive sublimate, but one of the easiest and most efficacious modes of extirpating them is to water the land with lime water. It is, however, said that while unslaked stone-lime is efficacious, lime of chalk has no effect upon them."

We have never endeavoured to get rid of these worms, and therefore have no experience as to the amount of salt or lime required per acre for their destruction. We should be glad to learn from our correspondent in what way they have been troublesome to him. Salt should be used very cautiously, as an overdose would injure or kill the grass.

The Curculio-catcher.

The following queries and replies respecting the curculio-catcher we cull from the *Prairie Farmer*, the editor of whose horticultural department was, if we mistake not the original inventor of this machine, and is therefore thoroughly competent to describe it. Some of our readers may feel inclined to try the "catcher" this year, though we trust that the vigorous and liberal action of the Fruit Growers' Association will soon "stamp out" the pestilent creature in this Province, and leave no necessity for further war against him :-

We have received a number of inquiries of late with respect to the height of trees must be to admit of our curculio catcher being successfully run under them, the weight a catcher ought to be, what preparation we make of ploughed ground before we pass over it, the number of trees one man can tend, cost of machine and if patented, and by whom made, &c., &c.

We are pleased to see that so much interest has been awakened to the importance of capturing the worst of all our insect foes, the curculio, and will cheerfully give any information we are able

It is very unfortunate that, in neighbourhoods liable to be infested by the curculio, low-headed trees, so called, should have been grown. By the term low-headed, we

mean trees branched so low that a team in cultivating, or a curculio catcher, cannot be conveniently run under them. But to the queries :-

1st. With respect to the height of the trees.

It is practicable with our cat her, as recently improved, to jar trees having clean stems not more than sixteen to eighteen inches high, though the labour of jarring higher-headed trees would be, perhaps, one-third less.

2nd. Weight of machine.

We have never weighed a catcher to ascertain just what the weight would be, but should suppose that one ten and a half feet wide by twelve feet long would weigh 75 to 80 pounds—possibly more. Such an implement would be large and heavy enough for the largest peach or plum trees, but too heavy for trees only three years old. For such small trees the catcher could be run under and the tree jarred by the operator with a long-handled padded mallet, carried in the back part for the purpose.

3rd. Making a curculio catcher.

The principal difficulty is in knowing how to curve the stretchers, and so balance and adjust the whole with respect to the wheel, that, by giving it a certain tilt, its own weight will in part propel it.

4th. Cost of a curculio catcher.

We are informed that the cost, exclusive of cloth (which any one can put on) boxed, will be \$18 or \$19.

5th. Preparation of ground.

Our orchard is kept under plough. After harrowing the ground, we load and drag a large scraper midway between the rows, and at right angles to this, up to the trees, level with a hoe. In driving the machine a man follows the path made by the scraper until opposite the trees, then turns and bumps the trees on one side of the path, backs to the centre, turns half round and bumps the opposite tree. Three or four bumps to each is sufficient. In this way one man will easily jar two hundred trees per hour. We suppose these catchers will be advertised in time for spring trade, provided the prospect for fruit the coming year continues good, when the manufacturer will doubtless give the additional information desired.

Insects Affecting the Plum

THE OBLIQUE BANDED LEAF ROLLER.

(*Lozotania Rosaceana*, Harris)

This moth is a member of a very large family of very little moths that are called, scientifically, Tortricæ or Twisters, and popularly, Leaf Rollers, because the larvæ roll up the leaves in which they dwell, and form them into hollow cylinders, disfiguring and destroying them at the same time. Most of these insects, when disturbed, let themselves down to the ground by a fine silken thread. The larvæ of the *Lozotania Rosaceana* is about half an inch in length; its colour is a pale yellowish-green, with three or four black spots about the head and second segment. The body, which is rough to the touch, is covered with minute warts, each of which produces a short almost invisible hair. They attain their full size about June, after which they line the surface of the twisted leaf in which they live with a web of fine silk, and there change into dark brown chrysalids. After the lapse of a few weeks the chrysalis, by means of minute prickles which are placed across the rings of its hinder part, pushes itself half way out of the leaf, and bursting open at the upper end gives egress to the perfect moth.

Dr. Harris thus describes the moth: "The forewings are very much arched on their outer edge, and curve in the contrary direction at the tip like a little hook or short tail. They are of a light cinnamon-brown colour, crossed with little wavy darker brown lines, and with three broad oblique dark brown bands, whereof one covers the base of the wing and is often very indistinct or wanting; the second crosses the middle of the wing, and the third, which is broad on the front edge and narrow behind, is near the outer hind margin of the wing. The hind wings are ochreous-yellow, with the folded part next to the body blackish. It expands one inch or a little more." The larvæ when disturbed escapes by its silken thread, and being very active often eludes capture.

Its depredations are sometimes very serious, and more especially as the insect appears to select the terminal branches of the tree, and thus effectually checks its growth. Whenever practicable, the curled and twisted clusters of leaves should be picked and crushed; it has also been suggested to thoroughly drench the trees with a mixture consisting of a pound of whale oil soap in seven or eight gallons of water, and thus destroy the caterpillars hidden in the leaves; a weak solution of carbolic acid is also recommended.

THE EYE-SPOTTED BUD MOTH.

(*Grapolitha oculana*)

This moth is a member of the same family as the one last described. The chief peculiarity of the larvæ consists in its selecting the opening bud for its attack. The caterpillar is a small cylindrical naked worm, about three-quarters of an inch in length, of a pale, dull, brownish colour, with small warts from which arise fine short hairs; the head and the top of the next segment being black. Its *modus operandi* is thus described by W. Saunders, who found it depredating his plum orchard: "Its tenement consists of a dried-up blackened leaf, portions of which are drawn together so as to make a rude case, the centre part of which, where his highness resides, is lined with silk. It is very fond of going just where you do not want it. It is partial to the blossoms and newly formed fruit. If you have a new pear or plum fruiting with a single bunch of blossoms on it, which you are anxiously watching, by and by you find that several of the blossoms have set, and while you are flattering yourself that they are doing well, along comes this mischief-maker, pitches his tent alongside this very spot, and drawing the young fruit together with silken threads, holds high carnival among them and frustrates your hopes. Another of its tricks is to gnaw a hole into the top of the branch from which your bunch of blossoms issue, and tunnelling it down, causes the whole thing to wither and die. Often it contented itself with damaging the leaves only, and this one does not mind so much, drawing one after another around its small inside case until it forms quite a little bed of withered and blackened leaves. The moth, which expands about half an inch, is of dark ash-grey colour, the fore wings having a paler whitish grey band across the middle; there are two small eye-like spots on each of them, one near the tip being composed of four little black marks placed close together in a row, on a light brown ground, the inner marks being longer than the others; the second eye-spot is near the inner hind angle, and is formed by three minute black spots arranged in a triangle, in the middle of which there is sometimes a black dot. The hind wings are dusky brown."

Similar remedies to those described for the last mentioned insect should be applied, hand-picking being the most preferable.—*E. B. Reul* in 1st Report of Entomological Society of Canada.

Correspondence.

Farm Accounts

To the Editor.

SIR,—Having seen in your valuable paper several articles on keeping farm accounts written, I suppose, by farmers, I send you in compliance with your invitation to write on that subject, an account of my system of Farm Book-keeping.

The first great essential in Farm Book-keeping is to take stock. The farmer, to be successful, requires just as much as the merchant, to know his true position once a year. I have always done so in the beginning of every year, and included in the category these items:—Number and value of acres of land, horses, colts, cows, fat cattle, young cattle, fat sheep, store sheep, pigs, chickens, barley, wheat, oats, corn, peas, potatoes, apples, turnips, pork, hay, implements, cash. Then by adding these several amounts up, and subtracting from them your debts, you have the nett amount of property or stock. I keep a correct cash book. On the left side page I put down all the cash I receive, and for what I receive it, and mark that Dr. And on the right side page I put down all the cash I pay out, and what I pay it out for, and mark that Cr.; and at the end of the year I sum all the cash I receive under these heads, viz.: *Items of Income*.—Wheat, sundries sold in market, corn, peas, barley, oats, wool, stock, pork, and to that add the balance of cash on hand the first of the year. *Items of Expenditure*.—Taxes, house furnishing, stock, labour, insurance, books, postage, &c., improvement on farm, doctor and medicine, church, poor, &c., blacksmith, seed, market fees, stabling, &c., implements, clothing, house expenses, and to that add the balance of cash on hand at the end of the year; and if your figures are correct both columns will add up exactly the same sum. My cash book has saved me more than once from paying an account twice; for when I was requested to pay the second time, my giving the date of payment in my cash book was always received as satisfactory. Then from these items of income and expenditure, by subtracting the one from the other, I calculate the nett profit for the year. To find out the yearly per cent. made on capital invested, I take the nett amount ascertained from taking stock, and find the per cent. on that, which will correspond with the nett profit for the year. Of course, that does not show exactly the per cent. made from the proceeds of capital invested on farm each year, for each year's crops are not always sold within the year, yet the result is accurate enough for all practical purposes. According to this method of calculation I find that in 1870 there was a little over 8 per cent. on capital invested; in 1869 about 9½ per cent.; and in 1868 about

10 per cent. My farm includes 200 acres. I have it laid out in ten acre fields, with lane and gates to each field. I have thus in all twenty fields; they are numbered from 1 to 20. Then I keep a Dr. and Cr. account with each field, and with each bushel of grain raised, and I do it in this way. I have what I call a day book, and for the encouragement of those who would like to pursue the same method, I may state that it only takes me five minutes every evening of a working day, and six days at the end of the year to figure out, and make all the calculations and tables, which I intend to show you here. Do you ask of me what would be the advantages from following such a course? I would answer, that this guessing in farming operations is a very sandy foundation for a young man to build success upon. Figures, my young friends, are very stubborn things; they will set up a fortification for you, which the designing cannot break down, and which they cannot even put stepping stones to climb over. They will increase in value every year; they will aid you in making your plans for your year's campaign of labour; they will make you a good General in conducting the very many manoeuvres and operations on the farm. They will give you a thorough knowledge of what is an average day's work on each of the operations of the farm, and if you have hired help, you can tell whether they severally come up to accomplishing what is an average, or go above or below that average. And last, not least, if you persevere, it will throw such a fascination about farm operations, that you cannot help but love the farm and be wedded to it for life, for better and for worse.

I can best explain the day book by giving you a copy from it of one week's entries.

June 20th 1870.—Cut hay, field 10, 1 day; ploughed field 18, 1 day; hoed potatoes, field 9, 2 days; cultivated corn, field 1, 2 days.

June 21st.—Worked at hay, field 10, 4 days; cultivated corn, field 1, 1½ days; hoed potatoes, field 9, 1 d.y.

June 22nd.—Worked at hay, field 10, 5 days; drew in 11 loads hay; cut hay, field 3, 1 day.

June 23rd.—Cut hay, field 3, ½ day; worked at hay, field 3, 4½ days; cultivated potatoes, field 9, 1½ days; ploughed corn, field 1, ½ day.

June 24th.—Drew in 13 loads hay, from field 3, and worked at hay, field 3, 6 days; cut hay, field 5, 1 day.

June 25th.—Worked at hay, field 5, 6 days; cultivated potatoes, field 9, ½ day.

Then at the end of the year I put the Dr and Cr. of each field into another book, which I call a journal, and I can best explain that by giving you a copy from my journal of one field for one year.

1871		1870	
Dr		Cr	
Potatoes, 545 bus. mine & small		41 days ploughing and harrow	
1 d. y. marking \$1.		1 wing	\$17 00
3 days work		1 day marking	1 00
\$22 25, 39 bus		33 days, cutting, planting & hoeing, cultivating	
1 pot t. ca	\$124 97	ing, ploughing and digging	
of turnips rotted before pulling, leaving sound.		potatoes	62 25
935 bus. at 10c	99 50	30 bus. seed potatoes	
Total	\$211 47	10c \$11 75	
Total cost	170 33	1 day cutting & unloading	
Profit	\$ 48 14	33	14 70
		6 loads of concentrated manure	
		100 lbs. seed potatoes	6 00
		1 day sowing & cultivating	
		1 day pulling & stacking	
		1 year's rent of 5 acres	30 00
		Total	\$176 33

I find that the potatoes cost 24c. per bushel—worth 33c. Turnips cost 5c. per bushel—worth 10c.

To ascertain the cost per bushel I adopt this method:—

F R POTATOES		F R TURNIPS	
4½ d. ys ploughing and harrow	\$ 8 60	4½ days ploughing and harrow	\$ 8 60
1 d. y. marking \$1.		1 d. y. marking	3 00
3 days work		6 loads of manure	6 00
\$22 25, 39 bus		60½ d. ys. work	45 38
1 pot t. ca	\$11 70	1 year's rent of 5 acres	15 00
1 year's rent of 5 acres	15 00	Total cost of raising 5 acres of potatoes	\$98 45
Total cost of raising 5 acres of potatoes	\$98 45	Total cost of raising 5 acres of turnips	\$77 88
		Then divide that amount by the number of bushels raised and you have the cost per bus. 24 cts.	

Then I take from my journal into another book which I call a ledger, and I can best explain that by giving you my ledger account of one field.

YEAR.	FIELD.	PROFIT	PER CENT.
1859	Hay	\$ 12 25	.....
1860	Potatoes, corn, turnips	111 2	.....
1861	Spring wheat	88 4	.....
1862	Hay	10 15	.....
1863	Hay	88 57	.....
1864	Pasture	.....	.....
1865	Barley	10 9	.....
1866	Fallow	.....	.....
1867	Wheat	43 74	.....
1868	Hay	91 12	.....
1869	Hay	11 5	.....
1870	Corn	117 73	.....

The rotation of crops in each field is not what I would have liked it to have been, for the clover killing or not catching obliged me to deviate from my plan.

The idea with which I commenced to ascertain the cost of each crop was that I would see which crop paid the best and stop raising those crops which paid the worst; but in ten years' calculations and experience I have failed to realize that idea, yet it has not been without great value to me. It has brought me to this conclusion, that on a soil like this a mixed husbandry is the most profitable, as a judicious rotation of crops is the least exhausting on the soil, and I have never seen a season in Canada but was favourable for some crop; and when a field shows me a loss in raising a crop, and the season has been favourable for that crop, then I resort to experiments to raise the fertility of that field. I find, moreover, that the price of all crops fluctuates very much both as regards the cost of production and the selling value. It has also brought me to another conclusion, that I consider hay, *not wheat*, the king of crops; for when I can get this soil to raise a good crop of hay, a good crop of grain is certain to follow, providing the season is favourable for that crop.

It also shows very plainly the difference between a farmer and manufacturer or mechanic. A manufacturer may make a machine or commodity at a certain cost, and tomorrow he may make another at the same cost; not so with the farmer, he has only one experiment a year; and if he can raise a bushel of grain this year at a certain cost, he may bring his operations as near as possible another year to the former one, and it may cost him double or only half. Now, then, the great problem to solve is the cause of that difference and its remedy. Let any one try a few such experiments, and will they dare to say a farmer needs no brains? Farming furnishes ample work for the greatest intellect. The greatest difficulty I see with regard to farming in our beloved Canada, is that they put out much muscle work with too little brain work attached to it. In my opinion the Legislature, and men of high standing in Ontario, deal unfairly with the farmer. Take for instance the Assessment Law, which assesses town property at 60c in the dollar for county purposes, and country property at 100 cents. Again, take the University of Toronto; it is a grand and noble institution, but is the agricultural student on equal footing? While in other departments there are many scholarships, there is no scholarship for an agricultural student; and what is the effect? While the other students can be counted by the hundreds, the agricultural students only number from one to three. Did our Government establish agricultural colleges on such a basis, that every young man who desires it could there obtain the best theory along with the best practice on farming, it would aid Canada to

take her position amongst the nations of the earth. One word with regard to ascertaining cost of crops raised. The account increases in value and interest to me every year; but if there were twelve farmers who would keep the same account of cost it would be twelve times as valuable to me; and if we met once a year to compare notes, would it not be interesting to see who could raise the largest crops with the least amount of cost? I have shown my calculations to many farmers, but never seen one who kept such an account.

I have spent now nearly twenty-eight years, the happiest days of my life, on a farm in Canada, and I love farming so much that it is a daily pleasure for me to attend to its daily duties. Would that I could so write as to inspire with the same feelings of delight in the farm our hundreds of farmers' sons, who are seeking and panting for something in which they may find more happiness than in a farmer's home. I was not always a farmer; from the time I was seven years old till I was seventeen I was an assistant in the sale of intoxicating liquer, and my blood thrills with horror when I contemplate that period of my life, as it was ten years of the most miserable part of my existence.

ROBERT EADIE, Junr.

Oakland P. O., Ontario.

Destruction of Birds.

To the Editor.

SIR,—The wanton and wholesale destruction of useful insectivorous birds has become so serious an evil that it is highly important, for those especially who feel an interest in agriculture, to take measures for the better enforcement of the laws enacted for the protection of these "farmers' friends." A number of influential gentlemen in this neighbourhood have accordingly agreed to prosecute vigorously all who infringe the law, and have signed the following notice:—

"NOTICE AGAINST WILFUL TRESPASS, AND SHOOTING GAME AND SMALL BIRDS OUT OF SEASON.

"Adverting to Acts now in force for the better preservation of game and small birds in Ontario, which Acts we each of us duly respect and appreciate, and taking into consideration that both game and small birds are gradually disappearing in this section of the country, we, the undersigned, each of us individually, jointly and collectively, hereby give notice to any person or persons who may be found on any of our lands or lots of land, shooting or otherwise destroying game or small birds 'out of season,' such person or persons, if detected, will by us be held guilty of *wilful trespass*, and such person or persons will be brought before one of Her Majesty's Justices of the Peace for the

offence, and he or they so trespassing will be held accountable for any damage he or they may be known to commit, either to our fences or our crops, &c."

In submitting the above notice for publication, at the request of the parties whose names are so numerous recorded thereon, I would gladly endeavour to speak a few words in favour of those useful small birds.

The farmer who allows any person to kill the small birds about his place is sadly wanting in generous feeling and sound judgment, and if he permits those birds to be destroyed because they deprive him of a few of his cherries or green peas, he, to use the vulgar phrase, "saves at the spigot and loses at the bung." Careful experiments have shown that every robin consumes, during the spring, summer, and autumn, fifteen pounds of worms. Think of that, every farmer who complains of the robin or any other small bird, for all eat in proportion. And only fancy, these thousand small birds that surround your homes eat annually fifteen thousand pounds of worms and other insects!

Now, taking into account the vast good they do the farmer, independent of their sweet melody, who is the well-thinking man with a generous mind that would permit the so called sportsman, or the boy with the murderous gun, to destroy them, and particularly out of season? Even the poor black crow, now so common amongst us he is the harbinger of spring, and is useful in his way. It is not to be denied that he pulls up a great deal of corn, and gives a deal of trouble, but he does it not for mischief, but in his efforts to assist the farmer. Every one knows the injury done to corn and other crops by the wireworm and cutworm; it is in pursuit of these grubs that crows and blackbirds pull up the young plants, at whose roots instinct teaches them that their prey lies; and it will be found that the fields most haunted by crows are most infested by the grub and the worm. This I mention to show the real habits of the crow, and I think we should meet with greater loss without his company.

The following statement shows that robins, crows and blackbirds are not the only consumers of worms: A distinguished American naturalist mentions in his remarks respecting small birds, that, "one morning, he saw the branches of a favourite tree overrun by many hundreds of coarse, hairy black and red caterpillars, often seen on willows, that he was on the point of going out to remove them, when he saw a male catbird light among and begin to eat them, occasionally flying away with some for its young. The bird continued this all day; by the same hour on the next day there were no caterpillars to be seen on the tree; the catbird had cleared it."

So of other birds, and the million of pounds of grubs and worms eaten by birds

would, if unconsumed, devour every green thing. But it is not only the earthworm, caterpillars and grubs, that these small birds destroy, for even the wheat midge is eaten by numbers of them, such as the swallow tribe, the whip-poor-will, and many others which catch their prey on the wing. These are also most useful to the farmers.

There used to be in years past a very small yellow bird of the meek tribe, much smaller than the native willow warbler. Its chief food consisted of the worms of the wheat midge; but of late years it has been very rarely seen. Many other English birds have entered the western portion of the country, and it is not only the larger kind of the swallows, but also many of the smaller ones, which are really doing the business here, a nuisance to the farmer, are held in the greatest abhorrence by those who wish to keep the small birds out of their fields.

The fact is, farmers, you should not allow such poachers to set foot upon your property. Indeed, it is high time that an effectual stop be put to this unlawful practice. At all events, if you cannot have positive proof as to the destruction of game or small birds out of their own nests, you at least can have them protected by a well-kept ledger.

If the farmer will but keep a ledger, he will be able to keep a record of the various transactions which occur upon his farm, and will be able to see at once where he is losing money, and where he is gaining it. This will be a great advantage to him, and will enable him to see at once where he is losing money, and where he is gaining it. This will be a great advantage to him, and will enable him to see at once where he is losing money, and where he is gaining it.

London, Ontario, March 20, 1871

Farm Accounts

To the Editor

Sir,—In the various recommendations with regard to farm accounts which have appeared in the *Canada Farmer*, it appears to me that there is one point that might be improved. In the first place, his own books, which he may keep, would do it, would take very little more paper and very little more time to enter the transactions of a different nature in different books than to mix in one book money transactions. The culving of cows, remarks on the weather, &c., as recommended on page 22 of this volume, page 42 of that for 1869, and elsewhere. When the time comes that we want to refer to these things, how much more easily we can find them if they are in separate places.

To make what I am about to say understood, I may mention that the book I have generally heard designated as a "ledger," is not exactly like the one described at page 23, but a book in which each person's account is kept in a separate place, and this I think the most necessary book to a farmer of any.

I think the farmer would do well to enter his money transactions in both day-book and ledger; but if he is not willing to take this trouble, I think (in opposition to most who have spoken on the subject), that he had better take the ledger. The persons with whom he has standing accounts will probably not be much over a dozen, and it will not be much more trouble, when he is entering a transaction, to turn to the right page, and enter it in the individual's account, and note it also at any time, by turning to the ledger, than to see how it stands, whereas, if he enters indiscriminately, it will be much more trouble to find out what has happened, and how it stands, than if he enters it in a ledger, which is possible, I would say, to keep this ledger and a memorandum book in which to enter those transactions which do not belong to the ledger, such as the calving, &c., of cows, bargains made, articles lent or borrowed, amount of grain threshed, weight of meat killed, &c. If he wishes to keep a record of the weather, he may find both pleasure and profit in doing so, but by all means put it in another book. If he wishes to find what he has gained or lost by each particular crop, or by each of the other operations he engaged in, it will be much easier to do so if he has a ledger, than if he has not one. It will be a great advantage to him, and will enable him to see at once where he is losing money, and where he is gaining it. This will be a great advantage to him, and will enable him to see at once where he is losing money, and where he is gaining it.

Number of manure used per acre. When sown. When harvested. Time spent manuring; ploughing sowing and tending; harvesting—threshing. Whole time spent. Acres in crop. Bushels per acre. Whole produce. Average price. Whole value of grain. Value of straw. Total value. To charge for rent or manure. To charge for seed. Net produce after these deductions. Value of labour, &c. Profit per acre. Cost of grain per bushel (reckoning the other items as above.) Wages earned per day Rent produced per acre. The charge for "rent and manure" should not be a regular charge per acre, for every kind of crop, but should vary according to the impoverishing nature of the crop, the barn accommodation it requires, &c. The pasture is rather renovating than impoverishing the land, and

requires no barn room at all, so it should be rated very low; the meadow (if the hay is consumed on the place and a fair share of the manure returned to the meadow) is probably renovating rather than impoverishing the land. It takes some room in the mow, but it requires neither barn floor nor granary, and, except for the accommodation of the cattle and the grain, a very cheap barn would do for it, so the rent ought not to be high. If a root crop is consumed on the place, it probably produces more manure than it receives, even though it may have been liberally manured, and accordingly (as it is already charged with the labour of manuring) the charge for "rent and manure" will have to be lower than with grain. Peas should be charged less than wheat, oats or barley, for they produce a larger supply of manure, and are less impoverishing to the land. Each can judge of these proportions for himself, but I should consider that an acre of wheat (if manured) should pay at least five times the rent that an acre of pasture would, to be equally profitable. On this plan the turnips and hay must not be valued at their full market price, but at what they are worth for feeding, or if they are sold off the place they must be charged with a higher rate for "rent and manure."

The price reckoned for labour must be such as to cover not only the expense of hiring, but the wear and tear of implements and the interest on their value.

Printed with Red Lead

To the Editor

A few days ago I had a yearling buckram bull worth three hundred dollars, which got access to two or three ounces of red lead and ate it. Upon discovering what had happened, we immediately gave him a strong dose of castor oil, followed in a few hours by some Epsom salts. The medicine purged him severely, I supposed that the lead was driven out, and that he would be all well again. But instead of that he became gradually duller, with symptoms of constipation. So we gave him more salts, and also some injections, but all was of no use he died to day (25th) in great pain.

Upon opening him we found that digestion had been stopped for some days, and that the medicine had not acted upon the stomach at all. The lungs and the heart also appeared dark and congested.

I have been requested to send this notice to your paper, as many persons are ignorant of the nature of this and like minerals, and very careless in the use of them, especially in the painting of outbuildings.

I hope that the above will lead my brother farmers to avoid the chance of a similar accident occurring with them.

WILLIAM ROY.
Darlington, March, 1871.

SEED.—We have not received the specimens sent for identification by Mr. Walbridge.

CLASSTH CULTURE.—An enquirer in reference to this crop is referred to the March number of the CANADA FARMER.

SEED WHEAT.—A correspondent sends a sample of spring wheat which he believes to be midge proof. If he has it for sale, he should advertise it.

OATS ON SHARES.—James Booth must give us more information respecting the terms of the agreement before we can answer his enquiries.

DRAINING.—Watling's "Draining for Profit and Health" is an excellent manual on this subject. Price \$1.50 American currency.

FAT CATTLE FAIR.—In reply to the enquiry of "North Dumfries," we should say that the establishment of a fat cattle fair would be a legitimate object for the funds of an agricultural society.

PROTECTION.—The question must be more definitely put. As a rule, both producer and consumer suffer by protective tariffs—traders by a hurtful interference with genuine trade, and the consumer by being made to pay a higher price for his goods. In other words, the thousand are ruined for the benefit of one, and that one is not interested or helped by the operation.

EARLY SOWING.—In reply to a correspondent from Leith, we should say that rape would be a profitable crop for his soil. It should not be allowed access to it at present, but if possible, be sown by hand to a limited quantity at a time. It should be sown pretty thickly—5 or 6 pounds to the acre—as soon as the ground is dry and warm enough. The seed can be procured of any of the seedsmen in the neighbourhood, and used for sowing.

THE CULTURE OF LIN.—M. J. P. writes to enquire how to grow it. We reply that if it is desired to raise it as a crop, it should be used sparingly, and not sown in a field, or better still, sown in a pot with manure, or mould in some other form. The best plan, usually, is to mix it with the soil by ploughing, before sowing. The land should be dry, to derive the full benefit from lime. From 50 to 70 bushels to the acre may be considered an average quantity. Our correspondent is referred for fuller information to an article on the subject in the November number of the CANADA FARMER of 1870.

CHANNEL ISLAND CATTLE.—A subscriber from Chinguacousy makes some inquiries about Jersey and Alderney cattle, in reference to which we would say that the breeds are somewhat distinct, though both diminutive, and noted for the richness of their milk. Very few Canadian breeders have them

—Mr. Sheldon Stevens, of Montreal, was the pioneer importer of the breeds—and they are probably still held at pretty high prices. They are becoming somewhat popular in the United States, among those who can afford to keep fancy breeds, or who want only a small set cow, easily kept, for the family dairy. We consider them too small to be profitably crossed with the Durham, the Ayrshire, or any other better cross with the Scotch, for dairy qualities.

CANARY AND BIRDS.—Mr. Stevens asks for information respecting the cultivation of canary and other small song birds.

SEED.—A correspondent asks for a recipe for a fattening food for infants and invalids, and equally nutritive.

CELLAR.—A correspondent asks if there is a possibility of building a good cellar where there is no drainage, and where the water rises to within six inches of the surface in spring and fall? It might be possible to construct a cellar under such conditions—for instance, by sinking a good sized water-tight cistern under ground; but the expense is so severely to be recommended. It is better to be content with a well, and a water pump, and a cistern.

The Canada Farmer.

PUBLISHED WEEKLY BY J. W. BROWN, No. 10, N. W. CORNER OF KING AND QUEEN STS., MONTREAL.

Systematic Farming

The article which appeared in our journal at the commencement of the year, concerning farm accounts, has excited several interesting and valuable communications from various correspondents, detailing their individual methods, offering suggestions on the subject, and all endorsing the great advantage of some system of the kind. It is certainly singular, and if the fact were not notorious, would scarcely be credited, that in this country, not one farmer in a hundred keeps any regular record of his transactions. As a rule, though, the farmer manages to gain a livelihood, and perhaps on the whole to prosper, yet he could scarcely tell at any one time whether he were solvent or not; he has but a vague and general idea of the profitableness of any particular branch of his calling, and if asked what was the actual cost of raising a single crop, could not give an intelligent answer. He sells his grain at the market price, but does not know whether he has realized thereby any profit, or only sustained a loss. Now, if any other business were conducted in the same manner bankruptcy would be the inevitable result; and most assuredly no farmer can make the best use of his capital or his land, and the

various appliances at his disposal, while he neglects to keep a regular system of accounts. He loans money in a hundred instances without knowing it, or if the fact be forced on his attention, does not know how or where to apply the remedy.

The errors of this negligent course and the advantages of an opposite system of conducting the business of a farm, have been repeatedly pointed out in this journal, and it is gratifying to see the matter taken up by farmers themselves, and to receive communications giving details of actual experience. We would especially direct the attention of our readers to an article in another column from Mr. Robert F. Fife, of Ontario. This gentleman for many years kept an accurate account of all the operations of his farm; he tells us what system he has pursued, giving examples which will enable others to understand his method, and laying before us some very interesting deductions. For example, he informs us in detail what has been in his own case the cost of each bushel of grain which he has raised during the period over which the record extends, and gives as an opposite instance of generalization, the profit per cent on the capital invested, which he has realized in a year a little over 8 per cent., and in 1868 at 10 per cent. He also tells us that there are not a few other farmers who could do the

same thing. In the instance, we learn that in 1868 the average loss of 10 cents per bushel in fall wheat, and a profit of 10 cents on the bushel of spring wheat. His experience with peas has been very discouraging, showing in the average of seven years a loss of 88 cents per bushel. This exceptional failure to him to have resulted mainly from the heavy expenditure of one particular year, in which, he tells us, his peas cost \$5.95 per bushel, and sold for 80 cents. There was, of course, in this instance, some peculiarity which is not explained, but in only one year during the seven did his peas realize any profit. The most advantageous crop appears to have been hay, the average profit of which he estimates at \$3.80 per ton. It was in reality far greater than this, for it was fed to stock, and gave, in addition to the increase of flesh, a valuable return in the shape of manure; but the gain is merely calculated from the market price of hay at the time and locality. Roots have also been invariably profitable. His statistics show, moreover, that the cost of raising each crop fluctuates even more than the price at which it is sold. This is particularly the case with wheat, while oats appear to have been most uniform both in cost of production and in price. As one inference deduced from these carefully noted returns, he concludes that a course of mixed husbandry is most advantageous.

It will be seen that the several statements and tables given are intended for illustrations merely, and do not furnish the net results of the farming, for no estimate is shown of the live stock, the most important item of all, and which, of course, the books would include with the same accuracy that distinguishes the rest of the accounts.

Mr. Eadie lays particular stress on the advantages he has derived from this systematic record, which increases in value every year, as the materials for comparison accumulate; and he calls attention to the great benefit that would follow the more general adoption of such a system of farm accounts, and the mutual interchange among neighbours of the results of their experience, with the opportunity of comparing notes derived from such a source. Farmers' clubs should make this a special object of attention.

There is no difficulty, and no great expenditure of time involved in such book-keeping. Five minutes each evening, and a week at the end of the year, sufficed to enter every particular, to post all up, and complete the full and accurate record to which we have referred.

We commend the letter to the attentive study of our readers, and we particularly commend the example of Mr. Eadie to every farmer in Canada.

the Sandford Howard

It is with sincere and deep regret that we announce the death of one of the pioneers of scientific agriculture on this continent. Sandford Howard, the esteemed Secretary of the Michigan State Board of Agriculture, died somewhat suddenly at Lansing, from paralysis, surviving the first attack only a few days. No man in the ranks of agricultural literature was more upright, diligent, and unassuming, or more generally beloved. All who have been associated with him in connection with the press will feel that they have lost a personal friend.

For more than thirty years Mr. Howard has been an earnest labourer in the field of agriculture. In 1841 he was associated with Mr. Tucker in editing the *Country Gentleman*. He afterwards became editor of the *Boston Cultivator*. He devoted special attention during his residence in Massachusetts to the importation of improved stock from Great Britain. He continued to prosecute his editorial labours in Boston till he was elected to fill the office of Secretary to the Michigan Board of Agriculture, shortly after its organization in 1864, and this office he filled with eminent ability up to the hour of his death.

No one, perhaps, has been longer associated with the American agricultural press or done more service in spreading a correct knowledge of agricultural principles and practice on this continent, and we venture

to say that no one has filled a similar position with more kindness of heart and soundness of judgment—qualities that have won for him in this country, as well as among his compatriots, a large number of friends who will sincerely mourn his death.

Ravages of the Wheat Midge in 1870.

On a former occasion we took the trouble to compile from the crop returns, contained in the Annual Report of the Commissioner of Agriculture, a table of the ravages of the wheat midge during the previous year, in the various counties of Ontario. We have now done the same for the year 1870, and have much gratification in stating that this pestilent insect has now almost ceased to be a terror in the land, and that its ravages are no longer, as we stated in 1869, "something frightful to contemplate."

In the following counties it is stated that there has been no midge during the past year, viz., Lincoln, Stormont, North and South Victoria, and Welland.

No reference at all is made to the midge in the returns from the following Electoral Divisions, and, therefore, we may infer that it has either inflicted no damage, or that the injury has been inappreciable in those parts of the country, viz., South Brant, East and West Hastings, East and West Middlesex, Niagara, North Norfolk, South Ontario, North Simcoe, West Wellington, and North York.

In the following divisions it is stated that "but little damage has been done by the midge":—Bothwell, East and West Durham, Dundas, East Elgin, Essex, Haldimand, North Hastings, South Huron, Kent, Lambton, South Lanark, South Leeds, North Oxford, Peel, South Renfrew, South Waterloo, North and South Wentworth, South Wellington, and East York.

We now come to a few Electoral Divisions where some little damage is reported.

In North Bruce "the midge caused some injury, but very little." In South Bruce "the midge affected a few places, but, on the whole, not seriously." In Cardwell "the midge damaged but little, except late-sown spring varieties." In Glengarry "the midge has been disappearing for the last few years." In West Northumberland "the damage by midge was very partial."

In only five divisions do we find that any serious loss has been occasioned by this insect. In Addington "perhaps a fourth of the wheat crop was affected by the midge." In Cornwall "the midge may have injured the wheat crop one-third." In Frontenac "the damage by the midge was considerable." In South Grey "the early spring wheat was greatly damaged by the midge." In Halton "the Deihl and Soules', and some spring wheat are damaged by the midge."

To recapitulate, we find that in thirty-

seven Electoral Divisions there has either been no wheat midge during the season of 1870, or, what probably amounts to the same thing, the returns make mention of none. In five some little damage has been done; and in five the injury has been considerable, amounting in one instance to, it is thought, as much as a third of the crop.

On the whole, the Report is most cheering, and we feel sure that every farmer in the land, every one, in fact, who cares at all for the welfare of his country, will join with us in the acknowledgment of our most humble and heartfelt thankfulness to the Almighty Giver of all good gifts, for the mercy which He has shown us in sparing to us the fruits of our increase, and ridding us to so great an extent, of this most destructive insect.

Notes on the Weather.

The indications of early spring noticed last month, have not been belied by the actual state of the weather. Though the frost was not everywhere altogether out of the ground, yet, in not a few places, farmers began ploughing before the end of March, and garden operations were pretty generally commenced. We hear as yet no complaints of injury to fall wheat, and farmers have no ground for anticipating any other than a favourable season.

On the whole, March has been marked by a somewhat higher temperature than usually experienced during that month, and while presenting no great extremes, some of the days, such as the 8th, 9th, 10, and 11th, were from 10° to 17° above the average, and only on four days has the daily average fallen below the freezing point.

The monthly mean was 31° 7, being 5° warmer than the average, and upwards of 8° warmer than March, 1870. The temperature was highest on the 9th—58° 5; lowest on the 24th—17° 0. The warmest day was the 9th, average, 45° 1; coldest, 23rd—3° 7.

The amount of rain was 2.5 in., being about double the average. The amount of snow was 13 in., being about the usual quantity, but affording a great contrast to March, 1870, when 62 in. fell. The number of snowy days was 12, of rainy days 8, of fair days, 15. There were 16 days clouded, 11 partially so, and 4 days free from clouds. The winds have been generally east and north-west, the former predominating in the early part of the month to a great degree. The first thunder storm of the season was experienced on March the 2nd, and appears to have been generally felt throughout Western Canada. As an additional trait of the early spring, our feathered visitors reached us sooner than ordinary. On the 1st, the song sparrow (*Spin. il. melodia*), and the robin (*Turdus migratorius*), and a day or two later the blue bird (*Sayca W. andi*).

Agricultural Implement Depot

In the interest of our subscribers and the public generally we are much pleased to find that Mr. William Rennie has opened an agricultural machine warehouse in this city, the object in so doing being to concentrate in one depot all the various implements manufactured in the different sections of the Province of Ontario.

The want of such an establishment has long been felt, and the business in question will doubtless prove a great boon to the farming community.

In many localities it has hitherto been impossible for the farmer to get at such machines as are here offered. Few farmers can afford to travel in search of every new implement that the ingenuity of some manufacturer may get up. The expense of such a search would be enormous, and the farmer would never have the advantage of the comparison here offered. Now he can see for himself, and compare and judge of the various merits of the different manufacturers. At this depot it is not the interest of the vendor to push one man's make more than another, as all are alike profitable to him. He buys very few things of any kind, and as he usually sells on commission it matters not to him which maker gets the preference. The purchaser buys the implement he prefers, without an exaggerated statement to influence his better judgment in guiding his purchase.

Every farmer can now set almost any kind of implement or tool he is likely to require, and by writing for it can get also a pamphlet sent him of all such as are offered for sale. He can thus select any that suit his views, and, if he desires, can order it without even seeing it, should his engagements prevent his coming to Toronto.

EDIBLE MUSHROOMS.—We have received a copy of a small work, by Mr. D. K. Winder, of Toronto, on the Edible Mushrooms of Canada. The writer appears to have devoted considerable attention to the subject, and gives his statements from personal experience. There is a list of the Canadian fungi collected by the author, and brief descriptions, with illustrations, of a few of the more common varieties that are suitable for the table. Seven of these are figured, including the common mushroom; and these are selected as being most easily recognized by the ordinary observer, and readily distinguished from any poisonous species.

BETTER ROOT SEED.—Any farmers desirous of procuring a small quantity of Sugar Beet seed for experiment, can have the same free of cost, with directions for cultivating, by applying to S. G. Harvey, at 36 Colborne Street, Toronto, personally or by letter.

Horticulture.

EDITOR—D. W. BEADLE,
CORRESPONDING MEMBER OF THE ROYAL HORTICULTURAL SOCIETY, ENGLAND.

How to Purchase Fruit Trees

The *Horticulturist* for February has a long chapter devoted to "Dishonest Tree Agents," and gives some instructions to intending purchasers to enable them to avoid being swindled.

One of these suggestions is to the effect that the purchaser should deal only with those tree agents who can show a written authority from some responsible nursery. It seems never to have occurred to the writer of that article that a dishonest tree dealer will have no trouble in writing out any number of certificates from most responsible and respectable nurseries, and that most of these to whom he sells would have no means of knowing whether the certificate be genuine or not. The only remedy is to buy only of such dealers as they know to be honest. There are honest men who deal in trees, and if, instead of buying from those who live nobody knows where, purchasers would buy of those who reside among them, and have something more at stake in the country than merely to get their money and be off, never to be seen again, they would be more likely to be fairly dealt with. If there be no such dealer convenient to them, let a few of the neighbours club together and send their order direct to the nursery. In this way the buyers will get their trees quite as cheap as if they bought of a dealer; if the order amount to much they will get them cheaper, and they will then know of whom they bought them, and have the character of the firm from whom they purchased as a guarantee of the genuineness of the articles.

One of the great frauds of dishonest dealers is very fully exposed in the article to which we referred. It is that of putting the name of the variety desired on a tree of some other sort. The dealer applies to the nurseryman for say 5,000 apple trees, of these 1,000 to be Baldwins. The nurseryman tells him that he cannot furnish more than 400 Baldwin, but can furnish 500 trees of some other good kind. To this the dealer assents, requesting that the trees shall be some nice-looking thrifty sort. The nurseryman puts in 500, say of Talman Sweet, and labels them correctly: but the dealer in putting up Mr. Smith's order, which calls for 100 Baldwins, puts up 50 Baldwins, perhaps, and 50 Talman Sweets, and labels them all Baldwin. When the purchaser receives his trees he knows nothing of the fraud that has been practised upon him, nor can he until his trees begin to bear, when he finds out that he has sweet apples where he

expected to find Baldwins. If he remembers the name of the nurseryman from whom his trees came, he doubtless blames him for the fraud, though in fact he is wholly innocent and knows nothing of the imposition that has been practised. Nurserymen know nothing of what the "tree agent" who buys of them at wholesale does with his trees—not even the name of the person who gave the order. It is a very common thing for our nurserymen to receive letters from persons who have given an order to some dealer in trees, giving some directions about the order, and saying "I gave an order to your agent," &c.; but the nurseryman knows nothing whatever of the matter.

But purchasers are not wholly free from blame, and have their own ignorance and unreasonableness to thank for much of the recklessness of dealers. We have known dealers say to the nurseryman, "I want so many R. I. Greenings for one of my customers; but he says they must be all perfectly straight and handsome trees, or he will not take them." The nurseryman replies that the R. I. Greening will not grow straight, and that neither he nor any one else can furnish him such Greenings—and now comes the temptation. The dealer knows that his customer will not be satisfied with crooked trees; his order is a good one; shall he lose the profits on that order, and all the time and labour spent in getting it, or shall he put in some tree that is straight and handsome—something as near like a Greening as possible, but yet not the kind ordered? So he asks the nurseryman what he can give him that is as good as a Greening, but is straight and handsome. At last he hits upon some variety that he concludes will do, consoles himself with the thought that the apples are as good or better than Greenings, that his customer will be satisfied with the tree, and that it will be some years before he finds out that he has—yes, has been cheated. It is not a week since we saw an order, asking, among other things, for a number of trees of the "Green Gage" plum, with most particular instructions that they must be all fine, large, thrifty trees. Now, every experienced nurseryman knows that the Green Gage is a most miserably wretched growing tree—a mere bush at best, and that any one who gives such an order is asking for impossibilities. What shall the nurseryman do? Shall he send the Green Gage? If he does, the indignant purchaser refuses to pay for them—they are not what he ordered. If he write to his patron, telling him that such Green Gage trees do not grow, the time taken up in correspondence makes it late before the trees can be sent. If he fill the order, leaving out the Green Gage and explaining the reason, he often receives a scolding for not filling the order.

These are merely instances given by way of illustration. Trees vary greatly in their habits of growth. Many of our most

esteemed varieties of fruit trees are, in the nursery, just grown, and are crowded trees, of slender form, and the finest who, in order to give his customer the exact kinds ordered, purchases trees that are too crooked or too thin, or too short, and the estimation of the purchaser is usually by a refusal to accept the trees at all, and accepted it is done with a great deal of grumbling, and usually at such a reduction that the transaction is a losing one.

It is not to be expected that all buyers of trees will be acquainted with the habit of growth and various qualities of the several kinds of trees they purchase, but it might fairly be expected, when they send their order to a nurseryman, that they should have enough confidence in his skill, his business reputation and his integrity of character, to trust him to send the best trees of the kind ordered that it is possible for him to send. If the order be given to a "tree agent," or dealer in trees, there should be the same confidence in his ability and integrity, or the order should never be given. For, as we have shown, the purchaser from a "tree agent" relies wholly on the honesty of the dealer, and nothing at all on the reputation of the nursery firm from whom the trees are purchased. That firm knows nothing of the several purchasers, and besides being too hard pressed with their own business to inquire, it would be a matter of mere impertinence if they did.

There is another requirement on the part of purchasers, which is often exceedingly embarrassing to both dealer and nurseryman, and which has indeed already been hinted at, but which deserves to be brought out more prominently—we mean that insane desire for large trees. One might be excused for insisting on large trees, were it his intention to make cordwood of them, but every thinking man knows or ought to know that the large tree is more sure to be seriously checked by transplanting, more in danger of dying, and if it lives will be longer in forming a tree. An apple tree at three or four years from the graft is as old and as large as it ought to be when sent out to the purchaser, and some of the varieties which grow rapidly will be larger and heavier at three years of age than other slower growing kinds at four years. Yet if the trees are not all of nearly equal height and size, the purchaser often finds great fault, as though the nurseryman had only to make a mould and cast his trees in it.

The effect of this demand for large and straight trees has been to induce the nurserymen to try and meet it, and the result has been exceedingly prejudicial to the buyer. Nurserymen know that if they can stimulate their trees to an excessively rapid growth, they will not only make them larger at a given age, but still larger. So they have set about to do this, and by the appli-

cation of the most stimulating manures make their trees as large at three years of age as they ought to be at four, and at the same time the crooked and rambling growers are, by means of crowding, forced into a more rapid growth, while the nurseryman perhaps gains something by getting the trees to bear a year sooner, besides a reputation for rapidity and handsome trees. But the effect of this stimulating process is to force the trees into a very sappy growth, to make the cells large and the wood soft and spongy. Such a tree is very poorly fitted to endure the rigours of our climate, and as a matter of fact we can point to several thousands of those trees which were planted in the county of Waterloo, giving great satisfaction by their handsome appearance when received, but of these not one in ten survived the first winter, and of those that did, not one in ten will ever make a healthy tree.

Would our planters take a little more pains to inform themselves concerning the habits of growth of the different kinds of trees, of the proper age and size of tree for transplanting, of the texture of the wood and natural appearance of naturally grown trees, and be content to receive trees as God and nature made them, and have patience to wait for them to grow, we should hear less of dishonest tree-dealers and nurserymen, and see more healthy and hardy orchards.

Fruit at Berlin, County of Waterloo

A member of the Fruit Growers' Association, residing at Berlin, writes that the Bartlett, and Ananas d'Été are doing well with him. The Bergamot is prolific, but inclined to be harsh, thin and watery. The Stevens Genesee promises to do well. The Flemish Beauty grows fast and bears well, but is somewhat flat in flavour, as compared with the Bartlett.

His Pomme Grise, Bourassa, Fameuse, and St. Lawrence apple trees, imported from Montreal, are coming on nicely, but he does not yet know whether they will bear well. The only good winter apples he has now in bearing are Bassets, and they are always worm-eaten. So it seems that the Collin-worm, that pest of our fine apples, has made its way into that part of the country. We advise him to read carefully that portion of the Report of the Fruit Growers' Association for 1879, page 91, which treats of this insect, and the way to destroy it. The fine engraving of the worm, in all its stages, will surely enable him to recognize it.

PLANTING A LILY-MACULATA.—This is an interesting variety of the Ethiopian Lily or Calla. The leaves are shaped like an arrow-head, light green, prettily marked with white oblong spots running parallel with the leaf nerves. The flower is white, and shaped like the well known Calla.

These grow best in warm, rich, mellow soil. The most beans are planted in drills, about two inches deep, and two inches apart in the row. The drills may be from one foot to eighteen inches apart. When the plants are three or four inches high, the earth should be drawn up to the stems, and just before they begin to blossom they should be again earthed up with loose mellow soil. They require to be frequently hoed while growing, that the ground may be kept loose and free from all weeds.

The hardiest variety is the Early Mohawk. Frosts that often quite kill other varieties, do not injure this. It is a good bearer, with long pods.

The Early Valentine is a favourite sort. It is a great bearer, and continues in use for a considerable time. It has been the chief reliance of the market gardener.

The Wax or Butter Bean has become a prominent sort in our markets within the past few years. The pods are thick, solid, and tender, of a light waxy yellow colour, and almost transparent. The ripe beans are black.

Pole or running beans are planted in hills, two by three feet apart, five or six beans to the hill, and covered about a couple of inches deep. It is of no use to plant until the soil has become warm. These beans need the support of a pole or rod, thrust deep enough into the ground to sustain the weight of the vines, usually about eighteen inches, and standing eight or nine feet high. Three healthy plants will be enough to grow in each hill.

The Speckled Cranberry is an excellent variety, and can be used either green or dry. It is productive and sufficiently hardy to grow and ripen well in our climate.

The Large Lima is the most delicious and buttery of them all, but requires a long season and dry, warm soil. It can be grown only in the more favoured parts of our Province.

Our farmers who grow Indian corn will find that they can grow the Speckled Cranberry without trouble by planting a few beans in each hill at the time of their first hoeing. The corn stalks will make poles for the beans to run on, and the crop will pay for the labour of hoeing the corn. And for family use they will find these beans more nutritive than potatoes, and in these days of potato rot, more certain.

MONEY IN THE GARDEN.—We have received a copy of a small octavo manual, with the foregoing title. It is written by Mr. P. F. Quinn, an experienced gardener, and is designed to give instruction in the management of the kitchen garden, the market garden, and the field culture of root crops. The directions are brief, plain, and practical, and the author very wisely discourages any one

from starting in the business of market gardening without previous training and experience. The work will be found useful to beginners and amateurs.

Carrots.

Those who have light loamy or sandy soil may enjoy the comfort and luxury of this vegetable. It is not only wholesome in itself and nutritious, but an excellent promoter of digestion.

To grow the carrot in perfection, the soil should be well worked and thoroughly pulverized, and well supplied with perfectly rotten manure. The seed should be sown about an inch deep, in drills one foot apart, as early as the ground can be nicely worked. An ounce of seed is enough for one hundred feet of drill. After the plants appear they will require thinning out to about four inches apart. They will grow better if frequently hoed, and the weeds never allowed to appear.

The Early French Short Horn is the best variety by far for table use. It comes to maturity early, and is sweeter than any other sort. The root terminates abruptly, not tapering gradually to a point as the ordinary long carrots, and on this account can be grown in a more shallow soil. It will keep also all the winter, if taken up in a dry day, the tops cut off about an inch from the crown, and the roots packed in earth or sand in the cellar or root-house.

The Altringham is next in quality to the Early French Short Horn. It is shaped like the ordinary long-rooted kinds, and requires a deep soil.

If any of our readers have not been in the habit of supplying their table with carrots, we earnestly recommend them to try the kind first mentioned. Boiled with meat or cooked in soup, it is a most excellent vegetable.

Cabbage Worms

To the Editor.

SIR—Can you or any of your numerous readers inform me of an effectual remedy for the ravages of a small white maggot which attacks the roots of cabbage plants and onions, destroying almost the entire crop of the latter? For several years I have not been able to raise onions to any extent, for although they grew well until the bulbs were pretty well grown, they were afterwards destroyed by the pest above described.

ENQUIRER.

Nottawasaga, March 15, 1871.

REPLY.—Mr Peter Henderson, in his "Gardening for Profit," says that soil abounding in lime is free from these insects and that he has endeavoured to bring up deficient soils, by heavy dressings of lime

but found that this answered only temporarily, and was too expensive. But he made an experiment with bone dust, which was very satisfactory. He had a lot of about half an acre, which he manured, the one half with stable manure, at the rate of seventy-five tons to the acre, the other half with bone dust, at the rate of one ton to the acre. The bone dust was sown on the ground after ploughing, and then thoroughly harrowed in. The half acre was planted with early Wakefield cabbage. During the early part of the season no difference in the two parts of the cabbage bed was perceptible, but as soon as the first hot days in June came, that part which had been manured with stable manure wilted down, showing a well defined dividing line, and on pulling up the wilted plants he found the pest mentioned by our correspondent had been at work upon his cabbage plants, while not a single wilted plant was to be found in that part of the bed which had been manured with bone dust. From this experiment Mr. Henderson concludes that this insect cannot exist to any injurious extent in a soil impregnated with lime, and that we have a preventive in the free use of bone dust.

Having every confidence in these statements made by Mr. Henderson we advise "Enquirer" to procure some bone-dust, which he can for about twenty-five dollars per ton, and use it freely as a manure for the ground where he grows his cabbage and onions this year, and send the results of his experiment to the CANADA FARMER.

Grape Queries

To the Editor.

SIR—Will you be kind enough to inform me what is the best mode of planting grape roots the proper time, and what varieties are best adapted to this section of the country?

Is it a good policy to plant strawberries with the grape roots? What is the proper time of planting strawberries, and how many to the acre?

J. E. C.

County of York.

REPLY—A very good method of planting grape-vines is described in the CANADA FARMER for 1871, page 105. They may be planted any time after the fall of the leaf, and before the buds burst in spring, and when the ground is in a condition to be worked. In the report of the Fruit Growers' Association of Ontario for '69, page 31, it is stated that in the region in which you reside, the Delaware, Clinton, Concord, Hartford Prohific, Allen's Hybrid and Adirondac, ripen their fruit every season. The Delaware is mentioned as never having been attacked by mildew or insects, and that in 'Scarboro' there is a small vineyard of about four hundred vines, chiefly Delaware. We should expect that Barry, Brant, Clinton,

Concord, Crevling, Delaware, Eumelan, Hartford Prohific, Isabella, Lindley, Massasoit, Sherman and Winder would all ripen in your section and do well.

One crop of strawberries might be grown among the grape vines, but not more. They should be planted in spring, in rows not nearer to the grape-vines than three feet, and about one foot apart in the row. If the grape vines are planted in rows twelve feet apart, there will be room for three rows of strawberry plants between each two rows of grape vines, with a space of three feet between the rows. If it is not desired to cultivate with a horse, the rows of strawberry plants may be two feet apart, which will admit of four rows, leaving a space of three feet between the strawberry plants and the grape-vines on each side.

To Make a Hotbed.

When I pass a Canadian homestead, and observe a neat, tidy, and flourishing garden, I generally presume that the owner thereof is a well-to-do farmer. A garden is to a thrifty man a source of great pleasure. A humble cottage with a tidy garden generally contains a neater family than a gorgeous mansion surrounded by briars and thorns.

In order, however, to possess an early kitchen garden, a hotbed is a necessity. This can be made with but little trouble. The only expense is in the purchase of a sash.

Make a frame six feet long by four feet wide; let the one end be two feet in height, and the other end one foot. Along the top of the long sides, about an inch from the upper edges, nail two cleats. This frame may be made of one inch boards. Glaze the sash and fit it upon these cleats, thus forming an inclined plane, which, when the bed is completed and the frame permanently arranged, should be made to face the south-east. In this manner the rays of the morning and noonday sun fall directly upon the growing plants.

To make the bed, draw well-rotted horse manure and pile it in a square heap, about three feet deep, and of sufficient dimensions to admit of the frame being placed securely upon the top. Within the frame, cover the manure heap with about six inches of rich earth. Put on your sash and leave it until the fermentation of the heap causes the earth to become warm. When this is effected, large dewdrops will form upon the inside of the glass. If the fermentation is not very active, cover the sash with boards, so as to prevent all radiation of heat from the pile. The frame may be kept still warmer by banking up the outside to the top with manure.

When the earth has become thoroughly warmed the bed is ready for sowing. To sow with the finger, draw drills about half-an-inch deep, take the seed of cabbages, cauliflowers, tomatoes, peppers, &c., between

the forefinger and thumb, and by rubbing the two gently and moving the hand along the drill, the seed may be sown evenly and thickly.

The great principle in the successful forcing of plants in a hotbed is to subject them to a sufficient amount of heat without allowing them to burn. This can only be regulated by experience and judgment. If, however, the weather be warm, by throwing open the sash during the day and closing it at night, the plants may be brought in contact with the external air, and will become more hardy and better able to bear the chilling effects of transplanting into the open.

A constant succession of early plants may in this manner be forced, and after their removal melons and cucumbers may be planted in their places in small sods, and when sufficiently forced, may be removed without being at all disturbed.

C. E. W.

Bark-splitting on Apple-trees.

I was much annoyed, a few days since—in March—at seeing the bark on one of our best summer apple trees split from the ground to the branches—a distance of over three and a half feet. The fruit of this identical tree is one of the best kind I ever tasted; it ripens in July, and in the beginning of August attains a size quite unusual in a summer apple. Many of them weighed ten to twelve ounces in the first week of August last, and were beautifully marked and with a surpassingly fine flavour.

After the injury was seen I at once consulted all the authorities at hand, but could not find any remedy; so in despair, I determined to form as good a substitute as the nature of the case would admit. I took the paint pot, which I always have ready for such emergencies, and after painting the trunk thoroughly, having also procured several cotton bandages of about three inches wide, I began at the root and bound them tightly all around the trunk from bottom to top, pressing the separated bark as tightly as possible to the trunk, with the view of entirely excluding the air. When the bandages were completed, and all bound tightly on and carefully fastened, I painted the outside of them thoroughly, thus as far as possible endeavouring to replace the bark that was parted from the tree, or rather compressing it back into its place so as entirely to exclude the air. I am aware that this bandage will produce strangulation of the sap vessels, if it is allowed to remain on longer than until next autumn. Up to that time I am inclined to think no harm will happen from that cause, and my artificial bark may cause the tree to form new young bark, so as effectually to mend the rent. Next winter I will provide some boards nailed together at the edges at a right angle, so as to defend the trees from the

action of the sun on the stem. I have somewhere read of this as a preventive, and, at all events, it will prevent the southern side of the tree from being exposed to the sun's rays whilst the northern remains frozen.

C.

A Few Fruits

The able editor of the *Gardeners' Magazine* expresses the opinion that the best new grape of 1870 is the Ferdinand de Lesseps, possessing "a new and exquisite flavour, combined with a most powerful and refreshing perfume. The fruit is small both in bunch and berry, the colour a fine deep amber, the flesh highly perfumed and of the most luscious flavour. The vine grows freely and bears freely."

THE BROCKWORTH PARK PEAR he considers the finest hardy fruit of the season. He says of it, "it is in every sense a noble variety, and should have a place in the choicest collections. The fruit is large and handsome, richly coloured, the flesh fine in texture, rich, vinous, and juicy. The tree is a robust grower, quite hardy and very prolific, and grows equally well on the pear or the quince."

THE BEAUTY OF HANTS APPLE is described as a "gigantic edition of the Blenheim Orange, the tree also being more robust and bearing its monster fruits more abundantly. The great size and beautiful form, the high colour and the tender flesh of this apple will secure for it a top place on the exhibition table, and render it one of the most taking of market apples in cultivation."

THE STRATFORD GILLIFLOWER APPLE is also highly commended. "It is a remarkably fine fruit, having the rich flavour of the Cornish Gilliflower, but the tree is more hardy and bears more abundantly. We are inclined to anticipate that it will supersede the Ribston Pippin, but must wait to ascertain the fact. For the present, however, we are quite satisfied that it is a first-class fruit."

To Destroy the Cucumber Bug.

A correspondent of the *Maryland Farmer* says:

"The following effectually protected my melon, squash, cucumber and other vines from the 'striped or cucumber bug,' the past season, with only one application, viz: a strong solution of hen house manure—say one peck of the manure to one and a-half gallons of water let it stand twenty-four hours, and sprinkle the plants freely with it after sunset. The above was suggested to me by a negro woman living on my place, who has some practical experience in gardening, and says she has used it for years, and has never known the first application to fail to drive them off, and they never return."

Double-flowered Tiger Lily.

The *Kivist and Pomologist* for February is graced with a handsome coloured plate of this new variety of the well-known Tiger Lily. The plant has the habit of our common variety, the stalks attaining to the height of about three feet, thinly covered with a cobweb of white hairs, and clothed with scattered leaves, having the usual miniature bulbs in the axils.

The flowers are about four inches in diameter, with six series of petals, of a bright orange colour, densely spotted with blackish purple spots.

This lily was exhibited at the August meeting of the Royal Horticultural Society, when it was awarded a first class certificate.

There is another variety, known as Fortune's Tiger Lily, which was brought by Mr. Fortune from China, and is remarkable for its vigorous growth and immense head of flowers, branching from the main stem in three successive series, thus prolonging its season of bloom.

The Royal Oak.

The English or Royal Oak thrives admirably in our climate, grows rapidly, and soon becomes a noble, ornamental, and useful tree. It thrives better in a rather heavy, moist soil, than in one that is light and dry. It is not to be expected that it will ever be as extensively cultivated here as our native species, but a few specimens might be planted here and there about our grounds, even if for no other purpose than to refresh our memory, and bring to mind many events in English history which no one using the language should ever wish to forget. The young trees of this oak can be obtained of most of our nurserymen.—*Rural New Yorker*.

New Double Wistaria.

Mr. Francis Parkman of Jamaica Plains, Mass., received a small plant of Wistaria from Japan, several years since, which bloomed last summer, when it was discovered to be a new and valuable variety, with double purple flowers. The plant is perfectly hardy, resembling the old *Wistaria sinensis* so well known as one of the most beautiful of all our climbing plants. It is to be hoped that Mr. Parkman will be successful in propagating this new and charming sort, for the more varieties we have of this beautiful genus the better. There are quite a number of distinct sorts to be found in the larger nurseries. Among the best, we will name *Wistaria sinensis*, with deep bluish flowers and very long trusses; *W. S. alba*, flowers pure white and trusses nearly a foot in length; *W. frutescens*, a native species, with small, compact

clusters of purplish flowers. The plant is a vigorous grower and usually blooms twice in a season. The *W. frutescens alba* is a charming sort, with white flowers, excellent for forcing under glass, as the plant is rather a stocky grower and not inclined to climb as much as other sorts. The *W. magnific*, with pale blue flowers, is also a handsome sort, and one of the most vigorous of growers. The *W. brochypoda* resembles the *frutescens*, the flowers smaller and deeper purple.—*Rural New Yorker*.

Our Best Fruits.

—
DUCHESS OF OLDENBURGH.

This exceedingly beautiful apple begins to ripen as the Red Astrachan passes away, and is one of our most useful and valuable varieties, both on account of the size, beauty and quality of the fruit, and the extreme hardihood of the tree. It will grow in all parts of the country, even in the Ottawa region, for it is almost as hardy as the Siberian Crab. It is a Russian variety, growing vigorously in our Canadian soil, forming naturally a roundish, spreading top, coming very early into bearing and yielding abundant crops. The fruit is full medium, always fair, very even in size, and regularly formed; the skin is smooth, ground colour yellow, streaked and washed with red, and covered with a thin bloom. The flesh is tender and juicy, with a sprightly acid flavour. As a cooking apple it is most excellent, and as a dessert fruit agreeable to those who relish a sprightly acid.

It is a valuable market fruit, commanding a ready sale and fair price, on account of its handsome appearance, uniform size and lively colouring. It may be safely planted, in moderate quantities, in the neighbourhood of large towns and cities for market purposes, but it should be borne in mind that, ripening in September, it will not keep long, and therefore must be sold at once.

—
BEURRE GIFFARD.

This delicious pear ripens after the Doyenne d'Été, is somewhat larger in size, and helps to continue the supply of choice summer fruit. It originated on the grounds of M. Giffard, of Angers, France; a mere chance seedling, not the result of any cross-fertilization designedly performed, but just one of those happy accidents with which nature seems to mock our best directed efforts, as if to say to a poor painstaking, "see, how easy it is for me to produce good fruit."

The tree has proved to be very healthy, and sufficiently hardy to thrive well in the vicinity of Toronto, and when more widely disseminated will probably be found to thrive well throughout a large part of Ontario. It has a slender habit of growth, causing the tree to look small, and somewhat puny, so that nurserymen find it difficult to grow it so as to please those who value trees according to their size.

The fruit is of medium size, and quite distinctly pear-shaped, with greenish yellow skin, handsomely marbled with red on the side next the sun. The flesh is white, juicy and melting, with a very pleasant vinous flavour and most agreeable perfume. Like most summer pears, it does not continue long, and is the better for being gathered early. We hope it will be more generally planted by lovers of good pears.

—
MANNING'S ELIZABETH.

This summer pear has not been planted as generally as its quality would warrant, and we name it in this connection in the hope of calling the attention of planters to its excellence, and inducing those gentlemen who value excellence of flavour more than mere bulk, to give this little fruit a trial.

From the fact that the tree has been so little planted hitherto it is impossible to say anything of its hardihood, though we believe it will be found to be fully as hardy as many others that have been more widely disseminated. Its habit of growth is moderate, and this is usually favourable to the endurance of our cold winters.

The fruit is small, not much larger than the Seckel, a good deal like it in form; of a bright yellow colour and clear red cheek, dotted with brown dots. The flesh is very melting, juicy, very sweet, yet having a sprightly aromatic flavour of a high character. It ripens about the end of August, and deserves a place in every gentleman's collection.

Trees for the Orchard.

—
To the Editor.

SIR,—I purpose to plant an orchard of five hundred trees in the spring; the following are the varieties which I am to get. The Duchess of Oldenburgh, Peck's Pleasant, King of Tompkins' County, Wagener, Colvert, Yellow Bellflower, Rhode Island Greening, Talman Sweeting and Red Astrachan. Are all these varieties profitable? Is the Colvert a fall or winter apple? It has been represented to me as a winter one. Is it a profitable business to raise plums? Are the following varieties adapted to the soil and climate of Ontario: German Prunes, Monroe, Bradshaw, Washington, Reine Claude de Bay, and Jefferson.

—
A SUBSCRIBER.

REPLY.—The Duchess of Oldenburgh is a hardy tree and an early bearer. The fruit ripens in September, and will not keep, consequently, it will answer only for a near market. It is showy and sells readily.

Peck's Pleasant is an excellent dessert apple keeping until 1st of March. It is not a showy fruit, but when once known will be esteemed by those who are judges of flavour. It is of no use for cooking.

King of Tompkins' County is large and

showy, so large that it drops easily from the tree, which is a drawback. It is of good quality, and keeps well through the winter. Would plant this with caution.

Wagener is medium size, red, good flavour, and keeps until the middle of February. Needs to be handled with care, else it will be badly bruised. Has not been generally known in market, but has sold well in the hands of those who have given it a trial.

Colvert is only a cooking apple, coarse and not showy, and has no good quality to recommend it as a market variety, except that the tree is an enormous bearer. It will not keep all winter.

Yellow Bellflower is too uncertain a crop for a good market apple. It yields better on well-drained clay loam than on sand. Fruit is large, when well grown, but not very attractive in appearance. Should plant this with great caution.

Rhode Island Greening is one of the most productive and well known market apples. Though not showy it is so generally esteemed for cooking purposes that the fruit sells. It is not easy to find a more profitable variety.

Talman Sweet is the best winter sweet baking apple we have. Yet the demand for sweet apples is limited, and judgment should be used in planting this sort for market. The tree is hardy and productive.

Red Astrachan is the most showy of all the summer apples; the fruit is of good size and showy appearance, the tree hardy, productive, and comes into bearing young. But it is only a summer fruit, and should be treated accordingly.

Plum raising, like stock raising, may be profitable or otherwise according to circumstances, facilities for marketing, skill and judgment of the raiser.

German Prunes are raised so very abundantly in Europe, and sold so cheaply in all our markets, that it will not be likely to pay in this country just now.

Monroe is a light coloured plum of medium size, with rich sugary flavour, ripening in September. The tree is said to be productive.

Bradshaw is large and showy, juicy and sweet, and would, no doubt, sell well. Ripens in the latter part of August. Tree bears good crops.

Washington is large, and of the first quality; tree very productive, and seems to possess qualities that should make it a good market sort.

Reine Claude de Bay. This variety is of good size and fine quality, but ripens so late that it should be planted with caution.

Jefferson is of the highest excellence, good size and handsome appearance. It ripens after the Washington, and will hang long on the tree. It is a fair and regular bearer, and in a market where quality is appreciated should pay as well as any sort.

DISTANCE APART OF ORCHARD TREES.—A correspondent from Whithy writes:—"Will you inform me of the best mode of planting an orchard, with regard to distance, &c.? Would you recommend planting plum trees as a source of profit?" Were we planting at Whithy, we should not set apple trees more than thirty feet apart each way. Pear trees may be planted much closer, say twenty feet each way, if on pear root, or twelve on the quince. Plum trees may be set about sixteen feet apart each way, and headed low. Other questions in the same communication have been answered.

Early Cauliflowers.

Every one who has tried to grow nice early cauliflowers in our climate has found his labours not always crowned with success. In spite of all his endeavours, many of the plants would not head at all, and many more formed such poor, half-starved looking specimens, that they could only be counted failures.

In an unusually cool and moist summer, the early cauliflowers are not so bad, but usually they are but a beggarly account of empty heads. This ill success is owing to the usual character of our climate, which are too hot and dry for the development of the cauliflower, and it is only when the heat of summer is past, and a cooler and moister autumnal weather sets in, that the blossom heads are fully developed. It is only in such a season as the present, in which the weather is so cool and moist, that the plants are protected from the heat and dryness of the summer, so that they may form good heads in July?

We find in the *Rural New Yorker* a suggestion for obviating this difficulty, and commend it to the attention of our gardening friends, and hope many of them will give it a trial and report to the *CANADA FARMER* the results of their experiment. The suggestion is to mulch the plants thoroughly, that is, to cover the entire surface of the ground, very soon after the plants are set out, with a liberal quantity of coarse strawy manure, or even straw or old hay, put on so thick that the ground shall be kept uniformly cool and moist. The writer of the suggestion states that he has had good success in this way, that his crop of early cauliflowers, when the plants are thus mulched early in the season, has been almost as certain as cabbages.

THE PHILADELPHIA RASPBERRY, thus far, is the most profitable fruit for us to grow. No variety we have met with equals it in productiveness on our light soil. It certainly is good when brought on the table, nicely powdered with sugar, and the spaces filled with cream, and few of our guests refuse to be helped the second time.—Isaac Hicks, in *Gardeners' Monthly*.

Parsnips

In selecting ground for parsnips, choose that which last year was very highly manured, and thoroughly and deeply worked. This vegetable delights in a deep, rich, well pulverized soil, of a sandy or light loamy texture, and forms smoother and better roots when the enriching has been done the year previous, and the manure thoroughly incorporated with the soil. If manure be given the same season, it should be most thoroughly decomposed. Coarse manure causes the roots to branch and fork and become stunted and woody, and it is better that the manure be selected.

This is a favorite vegetable with nearly all persons, and served with butter, or simply fried in butter and then fried they are most delicious for table use. There is but one variety worth mentioning, and that is the Long Hollow Crown, which grows more smooth and regular, and is of a finer and sweeter flavour than the Common Dutch or Guernsey. Another variety has been introduced of late under the name of The Student, but after growing it for a couple of years we fail to see that it possesses any qualities which make it superior to the Hollow Crown.

A few weeks ago the parsnips in the garden were much injured by a frost which was not so severe as that which we experienced a few days ago, but the frost had penetrated to the roots, and the plants were all so injured that they were now given up.

It is well to store a liberal quantity in the cellar for winter use. In taking them up care must be used not to cut or break the roots, for those that are whole retain their sweetness and freshness much better than those that are broken or cut with the spade. By digging a trench to the depth of the roots close beside the row, they can easily be taken out without injury. After digging they should be allowed to dry in the sun for a few hours, the leaves all removed, and then packed in earth in the cellar or root-house.

The seed may be sown as early as the soil can be worked, in drills sixteen inches apart, an ounce of seed being sufficient for a hundred and fifty feet in length. They should be thinned out to five inches apart in the row, and the ground well and often stirred.

LETTUCE FOR FORCING.—The best lettuce for forcing, and which sells best in the Boston market, is the Tennistall. This is stated on the authority of a cultivator who has tested more than forty varieties.—*Tillon's Journal of Horticulture*.

Peach trees are in full bloom in Illinois, and the prospects are good for a heavy crop. Apples also promise well, and wheat looks better than usual.

Frozen House Plants

Winter usually brings with it the complaint of frozen house plants.

Every summer, the goldfish laughers, or fine cultured ones, and more of them of each family, and finally some of Nature's gems, like the house plants. Those pets of our hearts are known to be far from their own homes, and lands that ours, and we know that they are so frail to withstand the rigors and cold of winter. Each autumn, therefore, it is the gathering of the goldfish, legs, and every available thing that will hold a plant—be it called as taste or judgment dictates.

The windows of the mansard and the cot are all the verdant with the foliage of growing plants. Many of these plants die of excess of heat or moisture before cold weather sets in, others put forth a very sickly growth, the prey of insects or the first cold snap. Some plants really dry up from neglect in watering them, aided by the dry heat of the room. Every one should know that great care and skill are needed to keep plants in a healthy state until after January 15th, when the days begin to lengthen and growth begins.

A room for mixed plants should not be heated above 65 degrees by day, or lower than 50, or higher than 70, or over 40 by night.

Should the sun raise the temperature to 70 or 80 degrees by day, no harm will be done. Foliage plants, and some others need a warmer room, while roses, pinks, and a few others, may be kept just above freezing, and are better for it.

This winter, we hear more of plants freezing than usual. Early in the winter the sudden change of the wind took many unawares, and spoiled their plants, and very cold weather has destroyed many more.

In two and a half years' residence in this city, I have but twice seen the thermometer below zero. Once during the winter the mercury was five degrees below zero at a few minutes before twelve o'clock, but rose to ten above at daylight. On such a night great care is needed to prevent plants from freezing. Many of the most careful have lost their pets.

But what shall be done with these plants? How can we soonest fill our windows again? are questions asked every day. The loss is great; we miss our plants as we do pieces of furniture or even members of the family.

Many throw the remains out of doors, others down cellar, while some kill what is left by kindness.

I would say, cut back the branches as far as frozen and to near the earth, if killed as far, water slightly, and only when the earth around the plant is dry and seems to need it. Do not keep the plant as warm quite as before it was frozen, and if there is any life

in the branches, they will soon show it by buds and leaves.

Many plants, such as fuchsias, will sprout from the roots and make a strong growth; others will start out near the roots, and send up healthy flowering branches. Watch and destroy the insects, if any appear.

But if it is feared and known that the old plants will not grow, seeds may be planted in the pots that will soon give foliage and flowers, or bulbs may be set in empty pots.

Hyacinths, crocuses, tulips, and other bulbs, may be set at once, and in a few weeks fine flowers cheer the household. Sow verbena, petunia, argeratum, alyssum, canna, mignonette, stock, zinnia, and many other kinds of seed, and you will have good bedding plants at least; sow good seed; do not waste your time with poor varieties.

For hanging baskets sow seed of lobelia speciosa or gracilis, abronia, mimulus, ice plant, nemophila, maurandia, and other climbing and hanging plants.—*C. L. Whitney, in Muskegon Enterprise.*

Transplanting.

The frozen-ball method of removing ornamental trees is preferred by many to all others for some purposes. It is well adapted to evergreens growing wild, if they are of much size. In order that it may be easily and expeditiously performed, preparations should be made in autumn or before the ground freezes hard, by digging a trench in the shape of a circle about every tree a foot deep, or as far down as the frost penetrates, and then filling these trenches with dead leaves, which are always abundant at that time of year in the borders of woods, or wherever these trees are sought.

The leaves will prevent the trenches from freezing in winter, and the earth within them being frozen hard, the trees are easily loosened and tipped over, and may then be readily transferred to sleds and conveyed to their place of destination, where holes, dug at the same time that the trenches were made, and similarly filled with leaves if convenient, or left open and frozen, may receive them. If holes and balls are both frozen hard, and are nearly equal in size, the first thaw will soften the ball and give it a close fit. But it is rather better to keep the hole unfrozen, so that the balls may be snugly imbedded in the mellow earth when placed there. For well rooted nursery trees this mode is not applicable, but we have found it adapted to the removal of evergreens from the borders of woods in winter, when the work could be more deliberately attended to than during the busy period of spring.—*Country Gentleman.*

TO KILL THE MILDEW ON ROSES.—Mix equal parts by weight of powdered sulphur and quicklime. Moisten with water, and let the lime slake in contact with the sulphur. After the lime is slaked, place the

whole in a kettle with plenty of water, and boil it until you get a saturated solution of the sulphuret of lime. This will be transparent and of an amber colour, and should be drawn off and preserved in bottles for use. A gill of this added to a gallon of water, and applied with a syringe, will kill the mildew without injuring the roses.—*Tilton's Journal of Horticulture.*

Fruit-raising in Gilford

To the Editor.

SIR,—I take some interest in fruit-raising, and find it both pleasant and profitable. I commenced on my farm (then mostly bush), about 11 years ago, and had this last year 300 bushels of apples, plenty of plums, some few pears, cherries in abundance, and a few grapes. I have given up the red and white currants and gooseberries; currant worms and mildew beat me. I find the people of this county buy lots of fruit trees, plant them in the most careless manner, take no care of them, let the cattle roam amongst them, and should any live for a few years, they become scrubby, unshapely things. Although we have any amount of beautiful evergreen and other forest trees, none are planted. One may travel all day through this fine county, and see fine farms, fine barns, and many excellent farm houses, but no evergreens, no shade trees of any kind to shelter their homesteads. Could there be any means devised to create amongst our farmers a taste for planting trees around their homesteads and farms, our country would soon assume a much more pleasing appearance.

It strikes me very forcibly that our Agricultural Society might co-operate with the Fruit Growers' Association in some way, so as to bring the subject of tree-planting more prominently before the public. Could this be secured, much good might follow, and in a few years our country wear a much more inviting aspect.

Truly yours,

X. X. X.

Gilford, Ont., March, 1871.

Old Sod for Cucumbers and Melons.

To the Editor.

SIR,—Some time ago I moved to a place which had been unoccupied for several years. All round the house was all tough sod; the soil was poor and sandy. In spring I fenced off a small piece of ground, and commenced to lay off a garden. Some of my neighbours seeing what I was about, advised me to let it alone, telling me I should get nothing for my trouble, the land being so very poor and soddy. However, I thought I would give it a trial. So I set to work with the spade, digging the ground to a depth of about six inches, and turning the sods down as flat as

possible. I next got some old rotten chip manure, which was all I could get conveniently, and spread it on the land I had dug; after which I took a strong rake and thoroughly mixed the manure and loose earth. I then made hills in the usual manner, and after letting the hills remain a day or two to get warmed by the sun, I set out my plants, which I had grown in pots made of turnips hollowed out. The plants grew rapidly, which gave me some encouragement, so that I took considerable care of them, watering them occasionally in very dry weather, always watering after sunset, and looking out sharply for cut-worms. The result was that my cucumbers commenced bearing very early, and bore abundantly. In the fall I had the largest and best crop of melons and tomatoes I had ever raised, the musk melons especially growing very large. The next year I tried the melons and cucumbers on the sod, and with the same result.

W. A.

New Plants

DRACENA CHELSONI.—Dracenas are plentiful, and a new one must be good to be worth attention. *D. Chelsoni* is a remarkably handsome plant, far surpassing in beauty some of the most famous of the genus, such as *D. terminalis* and others. In growth it is of free and distinctive habit, massive yet elegant. The leaves are large and boldly coloured, the ground colour being a solemn black-green, overspread with rich hues of metallic crimson in brilliant patches and soft clouds, the margins of the leaves being clearly defined with the same bright colour.

GENOTHERA WHITNEYI.—This is a valuable acquisition for the lovers of herbaceous plants, and destined, we feel sure, to become highly popular. The plant grows about a foot high; the flowers are four inches in diameter, produced in a great crowd at the upper part of the plant; they are of a pale pink colour, every petal presenting a rich heavy blotch of crimson purple.—*The Gardeners' Magazine.*

Marechal Niel Rose on a Celine Stock.

I have read with much interest the interesting articles on roses and their stocks from pens of no mean authority. All seem to be of one accord that Marechal Niel is a very beautiful Rose, and so say I; but there seems to be some difficulty in blooming it, and in many instances in inducing it to grow. As there are many differences of opinion as to the proper stock for it, I beg to offer my experience. I cannot too strongly recommend as a stock for it the Celine Rose which is a hybrid Bourbon of very strong growth, hardy, and the cuttings will root as freely as those of the Manetti. It will grow well in all soils, but is most at home in a sandy loam. Climate, however,

seems to make no difference to it, as it has thriven wherever I have had to grow roses. I have never found the Marechal nor any of the Tea or Noisette roses die on it, although I never could grow them more than a year or two on the Manetti.

I find that in light soils for most of the Tea roses, and especially when it is desired to have a dwarf plant of *Devoniensis*, the Crimson Bourzault is the best stock; but if the soil is at all of a clayey nature there is nothing to surpass the Briar. Of course I am referring to Tea and Noisette roses. Let me impress upon all lovers of Marechal Niel and roses of the same class never to buy or work it on the Manetti stock, for that is time and money thrown away, and will only end in disappointment.—J. T., *Macquarrie, South Wales.*

How to Grow tree Cactations

The cuttings should be struck in February, March and April. Take cuttings of two or three joints in length, remove the lowest leaves only, put them into pots or pans in sand alone, and place in a brisk, moist heat. When well furnished with roots, put them into thumb pots, and when needed shift to three inch size and so on, always observing that they should not be shifted until they really need it, nor be allowed to become pot-bound for want of a shift. As soon as they have recovered from the first shift, nip out the growing points and then stop them no more. Continue to shift as required until the middle of July, when they may be put in eight or ten inch pots, as both are good sizes in which to flower them. After the plants are established in the thumb pots they should be grown in as little heat as possible, and after they have had their last shift put them out of doors in an open situation, and stand the pots in a bed of coal ashes not less than six inches in thickness. When the pots are filled with roots, water with *very weak* liquid manure. The pots must be thoroughly drained, and the soil should consist of good turfy loam, quite free from wire worm, and about one third in bulk of old cow manure, and a liberal proportion of sharp sand. They may be housed towards the end of September, and should be kept near the glass in a cool, airy house for a fortnight, after that transferred to a warm green-house, and they will begin to bloom about the first of December, and continue in flower throughout the winter.—*Gardener's Magazine.*

Rose Seeds.—A correspondent asks for "instruction what to do with rose seeds, to make them germinate." Put them in a shallow box of sand, pure sand if possible, with holes through the bottom to secure perfect drainage, and place them out-doors where they will freeze and thaw with the changes of the weather. They should never be allowed to become dry. In the spring sow them in well pulverized soil, and cover just enough to keep them moist.

The Chinese Azalia

This is one of our most valuable plants for greenhouse or plant cabinet, because of the hardihood of its constitution, and the great beauty and profusion of its flowers. It will endure fifteen degrees of frost in a dry atmosphere, and in a moist one the thermometer may rise as high as one hundred without injuring the plant. If frozen, however, it should be kept from the sunlight, while at all other times it not only bears, but requires, full exposure to the rays of the sun—an abundance of sunlight being one of the great secrets of success.

It thrives best in a soil composed of sand (pure river or lake sand), loam and leaf mould, in equal proportions. The pots should be supplied with abundant drainage, say one-third filled with broken pieces of crocks, over which is laid a little moss, to prevent the soil from working down among the fragments of crocks and choking the drainage. It needs a regular supply of water—if exposed to the sun, as often as twice a day—and a syringing overhead at evening. If the plants are allowed to get very dry, they will be very sure to drop their blossom buds. After the flowering is over, the seed vessels should be all cut off, so that the vigour of the plant may be directed to preparation for next year's bloom.

Rhododendrons for Canada

We desire to call attention to the Rhododendron. Those who have seen this most beautiful shrub when covered with its profusion of flowers, will be deeply interested in what we have to say about its culture, and those who have never seen it will surely be grateful for having their attention directed to it, if they shall be thereby induced to plant it about their dwellings.

The Rhododendron *Catawbiense* is a native of North America, and may be found growing wild in this Province. Seedlings grown from this variety are perfectly hardy. Mr. Parsons, of Flushing, N. Y., writing last year to *Tilton's Journal of Horticulture*, gives the names of twelve varieties as hardy beyond question, growing as surely and freely as a willow, wherever a lilac will, requiring no shade, and no extra preparation beyond good garden soil. They need no special culture, no peat or other special soil, and require only to be planted where they will have plenty of sun, in good garden soil. For the first year or two after planting, they should not be allowed to flower freely; it weakens the plant too much, and thereby renders it liable to injury from extremes of temperature. Until fully established then, the flower buds should be freely removed; after that it may be left to its own way. But the European varieties are not hardy here, and it is of no use to plant these.

The varieties named by Mr. Parsons as

perfectly hardy, enduring a cold at least of fourteen degrees below zero, are Album elegans, Album grandiflorum, Bicolor, Celestinum, Candidissimum, Ernestianum, Grandiflorum, Bertie Parsons, Purpureum elegans, Purpureum crispum, Roseum superbum and Roseum elegans.

Nut-bearing Trees.

Hitherto no attention has been paid to the growing of nut-bearing trees in this country. We have some very fine native nuts; we have the chestnut, hickory nut, butternut, black walnut, hazel nut—all of which are very useful as they are found in their natural state, and might be planted out with great profit. We have no doubt but that a liberal plantation of any or all of these would be found to be a wise investment, for not only are the nuts valuable, meeting with a ready sale, but the wood is of great value now, and constantly increasing in price, so that in a few years hence, when these trees shall have attained sufficient size to be cut for the timber, a few acres of second-growth hickory, black walnut or chestnut, will be a most valuable property.

But these nuts are capable of great improvement; there is no reason why they should not be greatly increased in size, and possibly improved in quality. Will not our hybridizers—our Arnolds and Mills and Saunders—try their hands on the improvement of some of our nuts? Our hawks, for instance, are quite within reach. They might hope to see the fruit of their labours upon this nut or the chestnut, if not indeed upon any of them. Who will make a beginning?

How to Kill the Thrip on Grape Vines.

A. Huidekoper, Esq., of Meadville, Penn., writes to the *Gardener's Monthly* that he has tried quassia the present season with considerable success. He put half a pound of quassia chips, which may be procured from any druggist, in a large crock and filled it with boiling water, let it stand a couple of days, then poured off the water clear and syringed the vines thoroughly. The remaining quassia chips had sufficient strength left to allow of their being used in this way three times. He advises to commence this operation soon after the leaves form in the spring, and repeat the application about every ten days, until the fruit is about a third grown. If continued too long, the grapes will taste of the quassia.

Mr. H. does not tell how many quarts or gallons his large crock holds, forgetting that everybody does not know the size of the crock he uses. He made this application to vines under glass, but thinks it would answer for out-door vines, under some circumstances

Poultry Yard.

Preservation of Eggs.

This subject has recently attracted a great deal of attention, and many methods of effecting it have been published, though none are altogether perfect, for the simple reason that the true cause of the spoiling of the eggs is either unknown by those who have attempted to furnish us with directions, or has been lost sight of by them. There are two efficient causes for the spoiling of eggs, and unless one or both of these are avoided, we cannot hope for success. The first is exposure to a high temperature, and the other is access of air. It may be safely affirmed that, at temperatures below 32 deg. Fah., nearly all change ceases in organic bodies, while very few organic substances will bear continual exposure to a temperature above 90 deg. The freezing point is rather too low for the preservation of eggs in good condition, as freezing affects the flavour unfavourably; but if we desire to preserve eggs in the best manner, we must keep them cool—say at a temperature below 50 deg. if possible, a temperature which is frequently maintained in good cellars. But it will be of no use to place the eggs in a cool cellar if they have been previously exposed for hours to a temperature of over 90 deg. The collection of the eggs must therefore, in the first place, engage our attention. Now it has been well known that hens are most inclined to set in the months of May, June, and July, and that, during these months, the eggs in the nest are peculiarly liable to be set upon by brooding hens. On the other hand, during the month of August, and subsequently, the tendency to brood is not so strong, and the eggs are less liable to be injured. Those who raise poultry, and especially those who keep fowls for the sake of their eggs, commit a great error when they fail to remove from their yards those birds that are inclined to set, and which consequently take every opportunity of warming the eggs in the nests. If anyone will attempt to preserve eggs that have been subjected to the hatching process for one or two days, such person will discover the force of these statements.

Kohler, of Germany, who possesses an extensive poultry-raising establishment, and who, every winter, preserves thousands of eggs without ever losing one, has recently published an account of his method of proceeding, and has given the following rules for securing favourable results:—

1. The nest must be placed in a cool position.
2. The fowls that show a tendency to set must be removed at once, and placed in separate enclosures until this propensity has left them.
3. If many hens be confined in the same enclosure, or use the same nests for

laying their eggs, the eggs ought to be removed from the nests several times a day.

4. The eggs ought to be assorted according to age, and preserved in boxes with the covers always partially open. These boxes must be kept in a cool, airy, and perfectly dry place.

5. At the commencement of winter, the store of eggs is placed in some room that is not heated by a fire, but that is, at the same time, thoroughly protected from frost.

6. The packages are so arranged that the oldest may be used first.

Eggs treated according to these rules do not acquire the peculiar taste which is generally the result of the receipts in vogue for preserving eggs. The number of these receipts is almost unlimited. Some recommend the use of lard or butter, which, when rubbed over the eggs, fills the pores, excludes the air, and prevents the eggs from drying out. That there are powerful causes in the spoiling of eggs is easily proved, for the time that has elapsed since an egg was laid may be roughly estimated by taking its specific gravity. If we dissolve common salt in water, at the rate of 3 ounces of salt in 25 of water, it will be found that freshly-laid eggs will just sink in this solution. An egg that has been kept for one day will hardly sink to the bottom; at three days old it will float in the liquid, and when five days old it will float on the surface, more of it being elevated above the surface, in proportion to its age. These phenomena are caused by the drying out of the eggs, and the extent to which they take place in a given time depends somewhat on the weather. Smearing the eggs with lard or butter prevents this, but these oily matters are apt to become rancid, and thus destroy the flavour of the eggs. Dipping the eggs in lime-water is also recommended. The lime fills the pores of the eggs, and serves the same purpose that the grease did. Out of all the materials that have been recommended for this purpose, water glass, or silicate of soda, is the most effectual and least objectionable. —*Farmer* (Scottish).

White Leghorns.

To our American cousins is due the credit of having introduced certain admirable breeds of poultry. The Brahmas are undoubtedly second to none as useful fowls, being unsurpassed for size, hardihood and fertility amongst the incubating breeds. Another race, which is equally popular in the United States, as being at once most useful and ornamental, is that known as the white Leghorn. These fowls are hardly, if at all, known in this country; but, having tested their merits for two seasons, I can report most favourably of them, and fully endorse all that has been said in their favour on the other side of the Atlantic.

White Leghorns are birds of the Spanish type, but with white in the place of black

plumage. Their legs are bright yellow, and perfectly free from feathering on the shanks. The faces are red, the ear lobes only being white. The comb in the cock is thin, erect, and evenly serrated. In the hen it falls over like that of a Spanish hen. The tail in the cock is exceedingly well furnished with side sickle feathers, and in both sexes is carried particularly erect. The birds are active, good foragers, and have a sprightly and handsome carriage.

I find them to be abundant layers of full-sized eggs, the hens rarely showing any inclination to sit, but laying the whole year round, except during the time of the annual moult. The chickens are very hardy. I have not lost one by death this season. Unlike those of the Spanish, they feather quickly, and mature rapidly.

I regard these fowls as an exceedingly useful as well as ornamental addition to our stock of poultry. Whatever competitive shows may have done for other breeds, they have certainly materially lessened the value of Spanish as useful fowls. In the place of the large prolific hardy breed which was formerly known under that name, we have a smaller race, very leggy, and feathering with such slowness that chickens are often seen in prize pens that have not produced their tail feathers. In fact, the useful qualities of the race have been neglected in breeding for face and ear lobe.

The Leghorns possess the advantages of the Spanish without their drawbacks, and I have no doubt that they will become as great favourites in this country as they are in America.—*W. B. Fyfe*, in *London Field*.

FOWLS EATING EGGS—A correspondent writes:—"I have a lot of good hens but they have a bad fault; that is, no sooner does a hen lay an egg and commence to crow about it, than all the hens make a dash for the shell, and in eating the shell make a muss of the egg. Now, what must I feed them on to prevent this waste?" An adequate supply of animal food in some shape, with access to lime in some other form than the shells of their own eggs, will generally prevent this annoying habit in the poultry yard; but where it has been formed, dooming the delinquents to the table, and obtaining a fresh lot of better behaved hens, will probably be the best treatment.

FLAVOUR AND COLOUR OF EGGS.—There is a vast difference in the flavour of eggs. Hens fed on clean, sound grain and kept on a clean grass run, give much finer flavoured eggs than hens that have access to stables and manure heaps and eat all kinds of filthy food. Hens feeding on fish or onions flavour their eggs accordingly—the same as cows eating onions or cabbage, or drinking offensive water, impart a bad taste to the milk and butter. The richer the food the higher the colour of the egg. Wheat and corn give the best colour, while feeding on buckwheat makes the eggs colourless, rendering them unfit for some confectionary purposes.—*Cor. Country Gentleman*.

Apiary.

Successful Bee keeping in a Nutshell.

READ BEFORE THE AMERICAN BEE-KEEPERS' CONVENTION, BY ELISHA GALLUP.

The great secret in successful bee-keeping consists in knowing how to keep all stocks strong, so that at the commencement of the honey harvest they may have brood in all stages, nursing bees, and enough outside labourers. To illustrate this, A and B both have the same resources in their respective localities, or we will say that both reside in the same locality, and their honey harvest commences on the first of June. During the last half of July, and first half of August there is no forage for bees. June and the first of July are good, and the last half of August and the month of September are good.

A commences in spring to stimulate, equalize, &c., and replaces all old queens, or queens that do not come up to the standard of fertility, with young prolific queens and allows but little increase, that is providing surplus honey is the object. Here I will remark that with young prolific queens, and abundance of room, there is but very little danger of increase. On the first day of June, when the harvest commences, he has every stock completely filled with comb brood in all stages, nursing bees in abundance, less than sixteen days old, and honey gatherers over this age, and they are in the very best possible condition to commence storing honey immediately. Then during the scarce time, in the latter part of July and first of August, he stimulates and keeps up the fertility of the queens until the harvest again commences in the middle of August. His bees are then ready to commence storing surplus again as soon as the harvest commences. The consequence will be that A receives a profit in surplus honey and pronounces the season a good one. In fact, he meets every one with a smiling countenance, and is well satisfied that bee-keeping pays.

On the other hand, B commences with the same number of stocks, in the spring. He lets them manage themselves, and on the first day of June, they are not in condition to store surplus, or at least but very few of them, and these few he allows to swarm themselves to death, or what amounts to about the same thing. When the honey harvest comes in, his stocks commence breeding very rapidly, and by the time they get in condition to store honey, the harvest is done, or nearly so, for it takes twenty one days to hatch out workers, and about sixteen days more before they commence labouring outside. Now the scarce time comes on again, and B has got no surplus honey, but perhaps has a number of extra swarms. The queens stop breeding, especially if the forage is entirely dried up, or cut off. Now when the honey harvest commences in the middle of August, his stocks, instead of being in condition to commence storing, have to get nursing brood again to replenish their workers, for the brood hatched in June and July is very soon used up with old age, as the life-time of a worker bee is only from six to eight weeks, during the working season. Now you can readily see that B's stocks are expending all their force and energy to replenish their numbers again, and by the time they are ready to commence storing the harvest is past, and when he comes to sum up the season's operations, he finds he has received no surplus

honey, and his surplus stocks, or a large proportion of them, have either to be fed or doubled up, in order to winter them, and the consequence is, his face is somewhat elongated, and his conclusion is that the season has been a poor one for bees. He has certainly had bad luck, and he is ready to attribute it to anything but his own neglect or carelessness. For example the season has been a poor one for bees, or his climate is not adapted to bee-keeping, &c., &c. A, with his management, in the same locality, mind you, has had "good luck," as it is called. His stocks are all in excellent condition for wintering, no doubling up or feeding in winter, &c., for he has fed at the proper season, for I hold it to be a fixed fact that the summer and spring is the proper time to feed. Keep your bees in the right condition to store honey, and when the harvest comes they will store it. There may be seasons and localities where bees have to be fed in winter. But I have never seen such when they were properly taken care of in the summer. The whole secret of successful bee-keeping is contained in the above nutshell and should be the very first knowledge sought by the beginner in apiculture.

A Young Bee-keeper.

"On the 12th of August, 1869, I gave my little boy (8 years old), a swarm of Italian bees, on condition that he would study and learn how to manage them: the proceeds to be kept together till he became twenty-one years old. Last year they gave him a good swarm and ninety pounds of box honey, which would readily bring \$33 00."

We give the above extract, from a private letter, with a hope that other bee-keepers may be induced to follow our friend's example and thus excite an intelligent interest in the subject in the minds of their children. This boy will have a snug little property when he is of age—and better still, he will acquire habits of thought and investigation, that will be invaluable to him whatever occupation in life he may choose.—*Iowa Home-Steal.*

TRANSPORTING HONEY TO MARKET.—One great difficulty in the way of supplying the large markets with good honey in boxes, has been in getting it there in good condition. The comb being new and filled with heavy honey, and not very carefully handled, is broken down, and is soon churned up into a mushy mass. This is particularly the case in warm weather, and but little better success has been met with in holding it back till winter. Express and other transportation companies seem to have a particular spite at brittle things, and take extra pains to tumble them about. Most of the large-honey raisers find it necessary to accompany their honey to market, and see to handling it themselves. The section honey box has so far proved successful as a shipping package. It is only necessary to take the sections apart, and under each sheet of comb insert a block of wood half an inch square and five inches long, coated with hot beeswax as a support and as the comb is generally fastened at the top and sides, this holds it firm. I have shipped boxes thus prepared, over a thousand miles by river and railroad, that arrived in good order.—*D. L. Adair, in Southern Farmer.*

Queries

To the Editor.

SIR,—Some information through your valuable journal on the following points, is respectfully solicited by myself and other apianians, viz.—

1. Can I, for instance, sell a colony of bees in the Thomas hive to a person who has not a right to manufacture and use the hive? If not—
2. Can I sell to one who has?
3. Can I move a colony of bees out of one set of frames into another? If so—
4. What is the best method?
5. Which is the best season, before honey harvest or after?
6. It is held by parties in this neighbourhood that the outward appearance of the Thomas hive is not covered by patent, and because they use a different kind of frame, do not use revolving bands nor robber stop, though the cover and outward appearance of their hive in other respects is the same as that of the Thomas hive, they hold that they are not infringing on the Thomas patent. Is this correct?

AN INTERESTED BEE-KEEPER.

Perrytown, March 11, 1871.

REPLY.

- 1 and 2. You can sell a colony of bees in the Thomas hive to any person. If the party who purchases has no "right," he can use only the hive or hives he buys with the bees in; if he desire to make any hives he must buy the right of Thomas or his agent.
- 3, 4 and 5. A colony of bees may be moved from one set of frames to another at any time by simply taking out the frames and shaking the bees off, or brushing them off with a strong feather or wing, on to the frames of another hive; but if this is done in the breeding season there will be a large quantity of larva and young brood in the comb that would perish. Hence it is better to do it in the spring early, or late in the fall, when there is but little brood in the hive.
6. The mere outward appearance of the Thomas hive is not patented, but rather the peculiar construction.

BLEACHING BEESWAX.—Mr. L. G. Olmstead of New York, gives the following statement of a simple and convenient method of bleaching beeswax, that he saw practised in Italy: The yellow wax is first melted in a kettle, and then is dipped out into a long tin vessel that will hold two or three gallons, and which has a row of small holes, about the diameter of a knitting-needle, in the bottom. This vessel is fixed over a cylinder of wood two feet in length and fifteen inches in diameter, which is made to revolve like a grindstone, in one end of a trough of water, two and one-half feet in width, ten to fifteen feet in length, and one foot in depth. As the melted wax falls in small streams on this wet revolving cylinder, it flattens out into a thin ribbon and floats off towards the other end of the trough of water. It is then dipped out with a skimmer, (that may be made of osier twigs,) spread on a table with a top made of small willow rods, covered with a clean white cloth, and then exposed in this way to the sun until bleached.—*Manufacturer and Builder.*

Household.

Chilblains and Chapped Hands

When chilblains manifest themselves, the best remedy, not only for preventing them ulcerating, but overcoming the tingling, itching pain, and stimulating the circulation of the part to healthy action, is the liniment of belladonna (two drachms), the liniment of aconite (one drachm), carbolic acid (ten drops), to collection flexile (one ounce), painted with a camel's hair pencil over their surface. When the chilblains vesicate, ulcerate or slough, it is better to omit the aconite, and apply the other components of the liniment without it.

For chapped hands, we advise the free use of glycerine and good olive oil in the proportion of two parts of the former to four of the latter.

Chapped lips are also benefited by the stimulating form of application we advocate, but the aconite must not be allowed to get on the lips, for a disagreeable tingling results.—*London Medical Journal.*

Household Weights and Measures

Wheat flour, one pound is one quart. In diem meal, one pound two ounces is one quart. Butter, when soft, one pound one ounce is one quart. Loaf sugar, broken, one pound is one quart. White sugar powdered, one pound one ounce is one quart. Best brown sugar, one pound two ounces is one quart. Eggs, average size, ten are one pound. Liquid measure, sixteen tablespoons are half-a-pint.

Glues and Cements.

Many persons suppose that all that is required of glue or cement is to be sufficiently soft to be readily applied, not deeming it essential that a certain amount of heat is requisite to get the full strength. If glue is applied to wood, and the wood is left cold, it will immediately chill the glue, and a film will form that will prevent the glue from striking into the wood. If, on the other hand, the wood is hot, the process of cooling is necessarily slow, and the full strength of the glue is obtained. In no instance should there be a sufficient body of glue to prevent the surfaces of the wood to be joined from coming in close contact with each other. All that is required of the glue is to fill up the pores and exclude all air; if more than this is put on the full strength is not obtained.

As with glue, so it is with all cements suitable for uniting wood or metal. Not only must the cement be heated, but the materials to be cemented must also be hot. They should have a heat sufficient to melt the cement. If they are heated to this degree all air will be excluded, and the great cause of failure removed. Almost any of the cements in the market possess sufficient adhesive qualities to make them valuable, if they are properly applied.—*Carriage Journal.*

POLISH FOR CASTINGS.—It is said that a good way to polish plaster of paris castings, is to coat them with melted white wax, and then place them before a fire until the wax is absorbed; a considerable polish can then be obtained by friction.

Agricultural Intelligence.

Ancaster Farmers' Club

DRY EARTH SYSTEM.

At the regular meeting of the Ancaster Farmers Club held on the evening of the 27th February, Mr. Richard Postans read an able essay on "The Dry Earth System," the leading points of which we present to our readers.

The essayist said: This system, which is destined to become a great boon to mankind, was discovered a very few years since by a clergyman in England, where it is rapidly coming into use. Perhaps it would be more correct to say re-discovered, for a similar system is commanded and described in the book of Deuteronomy, Chap. xxiii, verses 12 and 13.

The system as applied to se-venge purposes, consists in the introduction of a certain quantity of dry earth into the vault every time that the closet is used. This earth possesses both deodorizing and disinfecting properties, and so thorough is the action of these properties that all noxious gases are at once absorbed, and if the earth be properly applied, the air in the closet seems always as pure as that in any other ordinary room.

The disinfecting qualities of dry earth are shown in a very marked degree by the remarkable cures that it has effected in cases where severe wounds had become running sores, the clay having caused the discharge to cease, and the sore to take on a healthy appearance in a very short space of time. Its healing qualities have also been shown in its successful application to severe flesh wounds and bad burns.

The cheapest implement for applying the dry earth, is an ordinary scoop shovel; but this is the most troublesome and the least effectual. A machine is now in use which has been patented by the Rev. Mr. Moulton the discoverer of this system, and no doubt other machines will shortly be introduced. These machines may be attached to any existing closet, which would require very little alteration.

The best kind of soil to use for these closets is a pure, or nearly pure clay; any soil, however, except pure sand, will answer. Thus the entire rural, and the majority of the city population, may obtain a thorough deodorizing material *dirt cheap.*

The earth requires very little preparation, and there is only one condition to be carefully observed, viz., that the earth be entirely free from moisture before it is used; and with our almost tropical summer this can be easily done. In one of the long dry spells that occur in the summer, as much of the thoroughly sun-dried earth as may be required for one, or even for two years' supply, should be collected and placed under

Poetry.

Old and New.

BY J. G. WHITTIER.

O somet mes gleams upon our sight,
Through present wrong, the eternal right,
And step by step, since time began,
We see the steady gain of man.

That all of good the past has had
Remains to make our own time glad,
Our common daily life divine
And every field a pasture

We lack but open eye and ear,
To find the Orient's marvels here:
The still small voice in autumn's hush,
A maple wood the burn'g bush

For still the new transcends the old,
In signs and tokens manifold,
Slaves rise up men: the olive waves
With roots deep set in battle graves

Through the harsh noises of the day
A low sweet prelude finds its way;
Through clouds of doubt and creeds of fear
A light is breaking calm and clear

For forth my heart shall sigh no more
For older times and holier shores
God's love and blessing, then and there,
Are now and here, and ever where.

The Angel of Patience.

Beside the tollsome way,
Lonely and dark, by fruits and flowers unblest,
Which my worn feet tread sadly, day by day,
Languing in vain for rest,

An angel softly walks,
With pale sweet face, and eyes cast meekly down
The while, from withered leaves and flowerless stalks,
She weaves my fitting crown.

A sweet and patient grace,
A look of firm endurance, true and tried,
Of suffering meekly borne, rests on her face,
So pure—so glorified.

And when my fainting heart
Desponds and murmurs at its adverse fate,
Then quietly the angel's bright lips part,
Murmuring softly, "Wait"

"Patience," she sweetly saith
"Thy Father's mercies never come too late
Gird thee with patience, strength, and trusting
faith,

And firm endurance Wait.

Angel, behold, I wait,
Wearing the thorny crown through all life's hours—
Wait till thy hand shall open the eternal gate,
And change the thorns to flowers

cover, so as to be thoroughly protected from the wet. Two or three good waggon loads will last an ordinary family a year, allowing that it is to be used only once. The fine and dry earth from a dry bit in a lamized or very sandy roads would answer very well.

In stationary closets the vault may be made of such a size as to go for three, six, or even twelve months without emptying. Surface water should be carefully kept out of the vault. A small door at the side or rear of the closet, gives access to the vault for the removal of its contents. The contents of the receptacle of the portable, or of the vault of the stationary closet, may remain until full without transmitting the slightest impurity to the surrounding atmosphere, and when they are removed the operation is attended with no more unpleasantness than if it were so much garden earth.

In places where it is difficult to obtain a supply of suitable earth, the contents of the vault, after being dried by the sun or by fire-heat, may be again used, being entirely inodorous, having the appearance of pure earth, and acting as effectively as when first used. This may be repeated as many as six or seven times, without impairing the deodorizing qualities, and each time greatly increasing the value of the material as a fertilizer. After seven fold use the material will have become about as strong in fertilizing qualities as Guano.

Experiments have been tried with the earth by applying it to turnips; one hundred pounds weight of earth that had been used seven times was applied to an acre with the most marked effect, not only upon the roots, but the benefit of the top-dressing was very apparent on the succeeding crop of turnips, both crops being much in excess of the yield from an equal quantity of ground adjoining; not thus manured; while the earth was applied with as little difficulty and unpleasantness as would be found in using so much bone dust.

Every ton of hay or bushel of grain, which is produced over and above the quantity necessary for home consumption, and which is in consequence sold out of the country, adds just so much to the wealth of that particular nation; and if every available fertilizer was returned to the soil at such a cost as to yield a handsome profit on the outlay, the profits thus secured would form quite an item in the annual exports of the country that might pursue such a course.

It is estimated that the human manure wasted in the United States, amounts to the annual value of fifty million dollars. This one fact is sufficient to clearly illustrate and prove the importance of this subject to agriculture.

Farmers have been advocating through the various agricultural journals the advantages of co-operative societies, and have made a practical move in that direction, in the case of cheese factories. Here is a good opportunity for co-operation. Let a number of

enterprising farmers, who happen to live near a town or city, form a company, rent a suitable building for a store-house and drying shed; let each shareholder deliver annually a certain quantity of dry earth at the store house, and receive his share of fertilizing material; let them employ men and horses to distribute dry earth to the closets and collect the waste earth again, and let them share the expenses thus incurred. If the size of the company and the extent of its operations be properly proportioned, the shareholders will thus secure an abundance of manure, at a cost far below its actual value, and they will thus promote their own interests and the public welfare.

Mr. Postans went on to show the immense advantages, in a sanitary point of view, which would assuredly accrue from the adoption of this system, and thus doing away with the thousands of festering pools of corruption, that like a many-throated monster stand up their poisonous breath to pollute the surrounding atmosphere.

Our space will not permit us to report thereunder of Mr. Postan's able essay, in which he pointed out in plain practical, and forcible language the advantage of this system in the prison, hospital, sick room, and dwelling-house; the simplicity of its actual working, and its effectiveness as a promoter of both private and public healthiness.

The Scotch Double-Furrow Plough.

An agricultural writer in the *Mark Lane Express*, describing a visit paid to Stirlingshire in the beginning of December, thus reports the working of the double furrow plough:

On the removal of the corn crop, the stubble is turned over on the first favourable opportunity, as deeply as possible. The double-furrow plough being admirably adapted for this work on medium soils, and a considerable number of them being at work in this district, and all giving much satisfaction to those who had the spirit to purchase them, I will here describe its workings. The one on this farm is of Scotch make, exceedingly simple in construction, easily thrown in or out of gear, and is turned at the end of the ground with as little difficulty as the ordinary swing plough.

The furrow slice was exactly nine inches in width by seven in depth, the soil admitting of nothing further; and yet it seemed to me that it was deep enough for all ordinary purposes, the work being so thoroughly well done. At this depth and width, and with the plough powerfully horse-drawn, the breadth gone over in a day amounted to an acre and a half imperial. Many persons may say that this is not doing much, but when it is taken into consideration that this work was done in the best manner, and but by one man and three horses, it will be found that it was really a great deal.

The most striking feature in looking along the furrow is the beautiful way in which the bottom is cleared out; no ridge, no unsoftened piece of soil being visible along its entire length. This is a matter always difficult to manage with the ordinary plough, but with this one it is easy; as, when once set, there is no possibility of missing. Viewing a break of about ten acres finished with this plough, I found every furrow neatly laid over to the proper angle, firmly packed, and the stubble completely buried. The field sloped considerably, and the ploughing was across; yet there appeared to be no difference in the quality of the work done, the packing being quite as firm on as off the land, or, in other words, as well and firmly laid up the hill as down. As large a surface was exposed to the disintegrating influence of the frosts of winter as could possibly be obtained, care being taken at the same time to preserve an angle on the furrow sufficient to defend the land from the injurious effect of heavy and continuous rain.

Comparing the work done by the single and double plough, as seen in the same field, the superiority of the latter was distinctly observable, both as regards quantity and quality, as with this implement drawn by three horses, and guided by one man, exactly the same amount of work was done as could be accomplished by four horses and two men, working the ordinary swing ploughs. In the one case, scarcely an open backed furrow was met with, while in the other, they were pretty numerous, and the bottom not nearly so well cleared out, as in many instances when thrown out by a stone, the horses had moved on several yards before the ploughman could recover his depth.

Looking upon the double-furrow plough as an implement which should be on every farm of sufficient size to require four horses, I yet consider it of no use in the hands of those farmers who keep light or badly fed horses, as disappointment and disgust will be the inevitable result of such men attempting to work it. To turn over the soil in a manner fit to bear inspection, the horses must possess both bone and substance, and be liberally fed so as to be above their work, and to be able to maintain a steady, unbroken step from morning till night. It is absolutely painful to witness the struggles and unequal pulling of weak, under-fed horses when on any plough; but with this one they cannot get on at all, unless it is lifted so far out the ground as to entirely destroy its efficiency.

Tea plants set out in California do not seem to thrive well. A new importation of fresh seed is now to be tried.

During the past winter the range of the thermometer has varied as much as 72° in New England within twenty-four hours.

Many milk cows and horses are being imported at the present time to the United States from Canada.

The Double Furrow Plough.

An important trial of double-furrow ploughs came off at County Kildare ploughing matches, on Monday, 20th January, near Athy.

In the makers' class, Gray of Uddingston, Howard, Mitchell, and Fowler, with their crack ploughmen, competed. To Gray was awarded the first and to Howard the second prize. The work done was excellent. In the farmers' class, a lad under twenty years of age with one of Gray's ploughs, won not only the first prize of his class, but another or the best ploughing under twenty years of age, and also the prize for the second best ploughed lot in the field, including single-furrows. The work accomplished by this lad was wonderful, considering that he had only practised a few days with the double furrow plough, and yet beat the crack ploughmen of the above celebrated makers.

At Londonderry, on Tuesday, the 31st, Gray's ploughs had a great success, being first, second, third and fourth.

In Scotland, Gray's ploughs have been equally successful at the following matches. At Dalkeith, on the 17th January—first, second and third; at Biggar, on the 17th, first; at Tilliecountry, on the 18th, first; at Currie, on the 19th, first, and at West Lothian, on the 20th, first (stubble); second, and fourth (lea).—*Farmer (Scottish)*

Swine Exhibition.

It is now definitely announced that the grand exhibition of swine, under the auspices of the Illinois Swine Breeders' Association, is to be held in Chicago on the 19th of September and two following days. The premiums are on a liberal scale, ranging from \$100 to \$20 in special classes, while the following general sweepstakes crowns the list:—

Best display of breeding hogs, one breed, not less than 10 or over 20, first premium.....	\$750 00
Ditto, second premium	500 00
Ditto, third premium	250 00
Best ten pigs, any one breed, under six months.....	200 00
Best boar and three sows, any age or breed, first premium	200 00
Best boar and three sows, any age or breed, second premium.....	100 00

The competition is, we believe, open to all. Communications on the subject should be addressed to Charles Snoad, Joliet, Illinois.

During the year 1869, there were sold in Atlanta, Georgia, 26,659 mules, and 12,219 during 1870; making nearly 40,000 mules in a little over two years.

From experiments made at the Iowa agricultural college during the past year, it appears that the Peachblow, Peerless, and Chili No. 2, potatoes, are less subject to attacks of the Colorado potato beetle than other varieties.

Richmond Farmers' Club.

Mr. Allen Pringle sends us the following report of the organization of a farmers' club, which we are pleased to chronicle:—

"A farmers' club designated the "Richmond Farmers' Club" was organized at the village of Selby, in the township of Richmond, on the 16th ult. A constitution and by-laws were adopted, and the following officers elected for the ensuing year:— Mr. Francis Van De Bogart, President; Mr. Wm. Dawson, 1st Vice President; Mr. Thos. Sexsmith, 2nd Vice President; Allen Pringle, Secretary and Treasurer; and Mr. Ira Hudgin, Assistant Secretary.

"The election of officers was followed by an interesting discussion on the question which had been previously selected for consideration, viz., "How to increase the fertility of our farms." As the subject was too broad for a full elucidation in one evening, the more important points were dwelt upon, such as manuring, under-draining, rotation of crops, summer-fallowing, &c. It is designed to hold a subject at each meeting for discussion at the next. Important discussions which I may deem of sufficient interest for your columns, I shall condense and report to you."

Ten thousand acres of land in Fecjee were recently purchased by a Scotchman for sixpence an acre.

The whole yearly income from the neat stock of the United States is estimated at no less than \$600,000,000, including beef, dairy and labour of working oxen.

The "Thames Cheese Manufacturing Company" of the township of North Dorchester has complied with the formalities of the Act for the formation of a company, and has been incorporated.

The "Watford Union Cheese Company" having complied with the formalities of the Act, has become incorporated.

About 20,000 egs were placed in the hatching troughs of Messrs Brown & Co.'s trout breeding establishment in Galt during the past season, from which over 25,000 spawn have been hatched. The young fry are thriving excellently and are rapidly increasing in size.

The Boston Journal of Chemistry states that manure is never so valuable as when it is fresh. It then holds in association not only all the fixed soluble substances natural to the solid excrement, but much that is of great value found only in the liquid. It is in a condition to undergo quickly chemical change, and the gaseous, ammoniacal products secured are double those resulting from that which has been weathered in a heap out of doors for several months.

The Cattle Commissioners of New York and several of the New England States recently met in Albany to consider what measures should be adopted to prevent the spread of the cattle disease, which has broken out in various sections. A disinfecting solution, composed of ten pounds of copperas, sixty gallons of water, and one half-gallon of thirty per cent. carbolic acid, was recommended for use daily in cattle yards. The Legislatures are memorialized to authorize the Commissioners to take prompt and efficient measures to prevent the spread of all such diseases; and farmers' clubs, &c., were asked to aid in carrying out preventive movements.

American growers, says the Morrisburgh Courier are just now making friendly raids upon our borders. For the past week they have been securing the country hereabouts in search of horses and cattle. The consequence is that many of our farmers have exchanged some of their stock for greenbacks. The prices paid for horses range from \$50 to \$120, and for such cows from \$25 to \$30, and even higher.

The farmers of Hillsborough County, N. H., held their last meeting for the season on the 22nd inst. at Milford, and discussed the important question, "How can we make our farms so attractive as to retain our young men and women at home?" It was generally and sensibly agreed upon that the farm residence should be made pleasant; and much was said of the probable good influence of local libraries, the cultivation of music, with a fair allowance of time for recreation and for escape from dusty drudgery. The question is one that deserves attention on the minds of Canadian farmers also. When the young men grow a few years older they will find what they have lost for the sake of standing beside a counter and wearing "store clothes," but in the meantime they should be attracted to stay at home.

Those persons who take pleasure in comparing the condition of different countries may be interested by the following statement of the number of farms throughout the United States, taken from the returns of the late census. Beginning with the smallest, there are 52,612 farms of three acres, and under ten acres; 157,810 of ten acres, and under twenty acres; 612,245 of twenty acres, and under fifty acres; 509,655 of fifty acres, and under one hundred acres; 486,249 of one hundred acres, and under five hundred acres; 20,289 of five hundred acres, and under one thousand acres; and 5,348 of one thousand acres and upward. The total number of farms is 1,942,241.

A correspondent of the Country Gentleman says that there can hardly be a greater sign of prosperity in a community than a disposition to help one another to a little lift when a neighbour's wheel gets stuck in the mud. An instance in point is where a man's barn and all his winter stores of hay and grain were consumed in a night; his neighbours all turned out, built him a new barn at once, and offered to assist him in wintering his stock, taking a head or two apiece, and returning them in the spring. Thus his loss was greatly reduced, and he was assured of the more durable riches of brotherly love and neighbourly good will. No one can compute in money the value of one such example of noble liberality in a community, especially in its influence upon the young. Where this spirit prevails there is sure to be progress in a place even if all improvements are in their infancy. People will like to come and settle in a place which bears such a good name.

SHORT-HORN SALES IN BRITAIN.—We have accounts of several important sales of Short horns in England. Col. Kingscote's sale came off on the 8th of March. There were 43 lots of cows and heifers. The highest price reached was 200 guineas for the cow Dora, the next 165 guineas for the heifer Dorado. The total amounted to 2002 guineas giving an average of about £48 15 each. Among the bulls the highest figures reached were 330 guineas for Oxford Beau, and 65 guineas for Duke of Fussbox. There were a dozen altogether, nearly all calved in 1869 or 1870, which realized a total of £1,311, or an average of about £69 each. Lord Fitzharding's sale followed on the next day, but realized only moderate prices.

Miscellaneous.

To Make Farm Life Attractive.

1. By less hard work. Farmers often undertake more than they can do well, and consequently work too early and too late.

2. By more system. The farmers should have a time to begin and stop labour. They should put more mind and machinery into their work. They should theorize as well as practice, and let both go together. Farming is healthy, moral and respectable; and in the long run may be made profitable. The farmer should keep good stock, and out of debt.

3. By taking care of health. Farmers have a healthy variety of exercise, but too often neglect cleanliness, eat irregularly and hurriedly, sleep in ill-ventilated apartments, and expose themselves needlessly to cold.

4. By adorning the home. Books, papers, pictures, music and reading, should all be brought to bear upon the indoor family entertainments; and neatness, comfort, and order, shrubbery, flowers, and fruit, should harmonise all without. There would be fewer desertions of old homesteads if pains were taken to make them agreeable. Ease, order, health and beauty, are compatible with farm life, and were ordained to go with it. — *Western Reporter*.

Useful Rules for Farmers

TO MEASURE HAY.

To measure the solid contents of different shaped stacks *exactly*, would require too complicated a process for general use; the following methods will give results sufficiently true for all practical purposes.

1. *In a mow*—Multiply length, breadth, and height in feet, and the product will be the number of cubic feet contained.

2. *In a round stack with a conical roof*—Multiply the mean circumference by .0533, and add to the product the perpendicular height to the eaves; this gives a computing height. Then multiply the square of the circumference by .08 and again by the computing height, and this product will give the solid contents in the stack.

Example—Required the number of cubic feet in a round stack with conical roof. The stack is 40 feet in mean circumference, and its perpendicular height to eaves is 12 feet; $40 \times .0533 = 2.132$. To this add 12, and we have for result 14.132, the computing height. Now the square of 40 is 1600; multiply 1600 by .08, and we have 128. Now, multiply 128 by 14.132, and we have 1808.596, the number of cubic feet in the stack.

3. *Oblong stack*—If the stack be oblong, with a roof in form of a triangular prism, to the perpendicular height of stack to the eaves add one fourth of its mean breadth for

the computing height; then multiply computing height by the mean breadth, and again by length, and the result will be the solid contents of the stack.

Example—Required, the number of cubic feet in a stack, with a roof in shape of a triangular prism, the stack being 15 feet across, and its perpendicular height to eaves being 12 feet, and its length 30 feet. One-fourth of 15 (mean breadth) is 3.75; add to this 12, and we have 15.75, which is the computing height; multiply 15.75 by 15 and we have 236.25. Now, multiply 236.25 by 30, and we have 7087.50 cubic feet in the stack.

When we have discovered the number of cubic feet in a stack or mow, we proceed to assign a given number of cubic feet to, say a ton of hay. In stacks that have lain over the year, about 343 cubic feet, or 7 feet every way, will make a ton of timothy hay; and 275 cubic feet or 6½ feet every way, of clover hay. In the mow about 729 cubic feet or 9 feet every way will contain a ton of old hay, and about 10 feet every way a ton of new hay.

These are not, however, by any means arbitrary rules, as much depends upon the quality of hay, and the manner of putting it in the barn or stack, but they are as true as can be obtained, without going into any elaborate calculation.

To find the number of gallons contained in a vessel by measurement of said vessel:

If the length, breadth, and depth of a vessel be measured in inches and multiplied together, the product divided by 277.274 will give the number of gallons that the vessel will contain.

When the vessel is very long, narrow and shallow, take the length in feet, the breadth and depth in inches, and divide by 23.106.

When the vessel is very narrow one way, broad and deep, take the narrow way in inches, the breadth and depth in feet, and divide by 1.925.

When all the dimensions are measured in feet, divide by .16.

For cylindrical vessels, circular wells, pipes, &c.:—

Take depth and diameter in inches and divide by 353.

Take depth in feet and diameter in inches and divide by 29.4.

Take depth in yards (or length as in pipes) and diameter in inches, and divide by 9.8.

Take depth in inches and diameter in feet and divide by 2.45.

Take depth and diameter in feet and divide by .204

MEASURING LOGS

To get the *exact* contents of a log, measure round the tree at the middle, square the result, and multiply it by .0795, and the product by the full length of the log, but practically it is sufficient to square the girth at midway, divide result by 4, and multiply the product by the full length.

NUMBER OF PLANTS IN AN ACRE.

The following table shows the number of plants that an acre will hold at different distances apart each way, and is useful in computing the number of cabbages, &c., required to plant a given space of ground:—

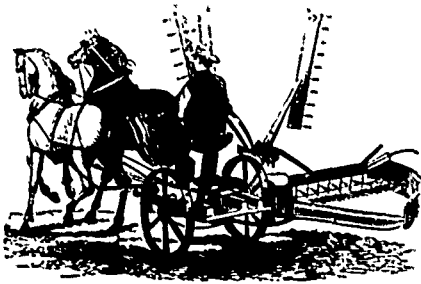
Distance between plants each way	Number of plants in an acre
Ft. in	
10 0	475
9 9	508
9 6	552
9 3	600
9 0	657
8 9	719
8 6	787
8 3	860
8 0	938
7 9	1021
7 6	1109
7 3	1202
7 0	1300
6 9	1403
6 6	1511
6 3	1625
6 0	1745
5 9	1870
5 6	2000
5 3	2134
5 0	2272
4 9	2415
4 6	2562
4 3	2714
4 0	2870
3 9	3031
3 6	3196
3 3	3365
3 0	3538
2 9	3715
2 6	3896
2 3	4081
2 0	4270

Preventive of the Decay of Wood

Experiments have been carried on in Paris for a long time in the intent of finding out a means of preserving palings, posts, etc., from decay. As a result of five years' experience, a paint is recommended which at the same time possesses the advantage of being impervious to water. It is composed of fifty parts of tar, forty parts of finely crushed chalk, five hundred parts of fine, white hard sand, four parts of linseed oil, one part of the red oxide of copper in its native state, and finally, one part of sulphuric acid.

In order to manufacture the paint from this multiplicity of materials, the tar, chalk, sand and oil are first heated in an iron kettle; the oxide and sulphuric acid are then added with a good deal of precaution. The mass is then carefully mixed. It is now ready for use, and must be applied while hot. In coating the timber a stiff brush is used. After this paint has cooled and dried, it forms a coating or varnish quite as hard as stone.

A correspondent writing to the New York Farmers' Club says that he has known a very foul cask to be entirely cleansed by filling it with dry earth and leaving it four or five days. The earth treatment, followed by scalding lime-water, will sweeten anything but a very old and rancid tub.



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No. One and Two Buckeye Combined
Reaper and Mower, with Johnson's Self-Rake Improved
for 1871.

We believe this machine, as we now build it, to be the most perfect Reaper and Mower ever yet offered to the public of Canada.

Among its many advantages, we call attention to the following:

It has no gears on the Driving Wheels,

Enabling it to pass over marshy or sandy ground without clogging up the gearing, thereby rendering it less liable to breakage. It is furnished with four knives two for mowing and two for reaping, one of which has a sickle edge for cutting ripe, clean grain, the other a smooth edge for cutting grain in which there is grass or seed clover.

It has malleable guards both on the Mower bar and Reaper Table, with best cast steel Ledger Plates. It is also furnished with our new Patent Tilting Table for picking up lodged grain. This is the only really valuable Tilting Table offered on any combined Reaper and Mower. The Table can be very easily raised or lowered by the Driver in his seat without stopping his team. This is one of the most important improvements effected in any Machine during the past two years.

Any one or all of the arms of the Reel can be made to act as Rakes at the option of the Driver, by a Lever readily operated by his foot. The cutting apparatus is in front of the Machine, and therefore whether Reaping or Mowing the entire work of the Machine is under the eye of the Driver while guiding his team. The Table is so constructed as to gather the grain into a Bundle before it leaves the Table, and deposits it in a more compact form than any other Reel Rake.

The Table is attached to the Machine both in front and rear of the Driving Wheel, which enables it to pass over rough ground with much greater ease and less injury to the Table. The Grain Wheel Axle is on a line with the axle of the drive wheel, which enables it to turn the corners readily.

The Rakes are driven by Gearing instead of Chains, and therefore, have a steady uniform motion, making them much less liable to breakage on uneven ground, and more regular in removing the Grain. The Gearing is very simple, strong and durable. The Boxes are all lined with

BABBIT METAL.

The parts are all numbered, so that the repairs can be ordered by telegraph or otherwise, by simply giving the number of the part wanted. There is no side Draught in either reaping or mowing, and the Machine is so perfectly balanced that there is no pressure on the Horses' necks either when reaping or mowing. All our malleable castings, where they are subject to much strain, have been twice annealed, thereby rendering them both tough and strong. Our Johnson Rake is so constructed as to raise the Cam so far above the Grain Table that the Grain does not interfere with the machinery of the Rakes or Reels. We make the above Machines in two sizes—No. One, large size for Farmers who have a large amount to reap—No. Two, medium size for Farmers having more use for a Mower than a Reaper. With the exception of difference in size, these Machines are similar in every respect. Our No. 2 Machine supplies a want heretofore unfilled, viz.: A medium between the Jun. Mower and large combined machine, both in size and price. We shall distribute our sample machines in March among our Agents, that intending Purchasers may have an early opportunity of examining their merits, and we guarantee that all Machines shipped this season shall be equal in quality and finish to the samples exhibited by our Agents. We invite the public to withhold giving their orders until they have had an opportunity of inspecting our Machines, as we believe that they are unsurpassed by any

other machines ever yet offered on this continent. We also offer among other Machines,

Johnson's Self-Raking Reaper, improved for 1871, with two knives, smooth and sickle edge, and malleable guards.

Wood's Patent Self-Raking Reaper.

Buckeye Reaper No. 1, with Johnson's Self-Rake.

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Ohio combined Hand Raking Reaper and Mower.

Cayuga Chief Jr., Mower.

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Buckeye Mower No. 2.

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For further information, address

F. W. GLEN,
PRESIDENT,
OSHAWA, ONT.

THE NEW YORK TRIBUNE.

1871.

Through struggle and suffering, at the cost of multi-form agonies, bereavements, devastations, the American Idea embodied in the preamble to our fathers' Declaration of Independence approaches its complete realization. The noble inspiring assertion that "all men are created equal," and endowed by their Creator with inalienable right to life, liberty and the pursuit of happiness, is no longer a glittering generality, a poet's fancy, a philosopher's speculation, but the recognized base of our political fabric. The benign Revolution, which dates from the Boston Massacre of 1770, finds its logical completion just one century later, in the XVth Amendment, which gives to the equal political and civil rights of every man born or naturalized in our Republic the shield and defence of the Federal Constitution. The billows of Caste and Privilege may roar and rage around that rock, and may transiently seem on the point of washing it away; but its foundations are laid deep and steadfast, and the breakers of Reaction and Slavery are hurled against and dash their spray over it in vain.

We do not underrate the forces of Prejudice and Aristocracy. We do not forget that a very large minority of the American People still hold in their inmost hearts that Blacks have no rights which Whites are bound to respect. We fully appreciate the desperation wherewith all the warring elements of hatred to Republican achievement will be combined and hurled against the battlements of Republican ascendancy in the Presidential Election of 1872. We do not doubt that local successes, facilitated by Republican feuds and dissensions, will inspire the charging host with a sanguine hope of victory, such as nerved it to put forth its utmost strength in the earlier stages of the contests of 1864 and 1868. Yet our faith is clear and strong that the American People still bless God that, on the red battle-fields of our late Civil War, the Union was upheld and slavery destroyed, and will never consciously decide that the precious blood thereon poured out was lavished in vain.

THE TRIBUNE believes in the prosecution of the great struggle by legitimate means to beneficent ends. To State Sovereignty, it opposes indissoluble National Integrity; to Slavery for Blacks, Liberty for All; to Prescription, Enfranchisement; to Popular Ignorance, Universal Education; to intensity and eternity of wrathful Hate, universal and invincible Good Will. It would fain do its utmost to hasten the glad day when the South shall vie with the North in exultation and gratitude over the disappearance of the last trace or taint of that spirit which impelled Man to trull in the ownership and chattelhood of his fellow Man.

Profoundly do we realize that the contest is not yet ended—that Millions mourn, more or less publicly, the downfall of the slaveholders' Confederacy, and rear their children to hate those by whose valour and constancy its overthrow was achieved. If we ever seem to differ essentially from other Republicans, our conviction that magnanimity is never weakness, that vengeance is never politic, and that devils are not cast out by Eelzebub, must serve to explain alleged eccentricities whose perfect vindication we leave to Time and Reflection.

THE TRIBUNE has been, is, and must be, a zealous advocate of Protection to Home Industry. Regarding habitual idleness as the greatest foe to human progress, the bane of human happiness, we seek to win our countrymen in masses from the ensnaring lures of Speculation, of Traffic, and of always over-crowded Professions, to the tranquil paths of Productive Industry. We would gladly deplete our over-crowded cities, where thousands vainly jostle and crowd in misguided quest of "Something to Do," to cover prairies and plains with colonies absorbed in Agriculture, Mechanics and Manufactures, and constantly projecting into the blank, void wilderness the homes and the works of civilized Man. Holding the Protection of Home Industry by discriminating duties on imported Wares and Fabrics essential to the rapid, beneficent diffusion of Production in all its phases and departments, and so to the instruction of our people in all the gainful arts of Peace, we urge our countrymen to adhere to and uphold that policy, in undoubting faith that the true interest, not of a class or a section, but of each section and every useful class, is thereby subserved and promoted.

THE TRIBUNE aims to be pre-eminently a News-paper. Its correspondents traverse every State, are present on every important battle-field, are early advised of every notable Cabinet decision, observe the proceedings of Congress, of Legislatures, and of Conventions, and report to us by telegraph all that seems of general interest. We have paid for one day's momentous advices from Europe by Cable far more than our entire receipts for the issue in which those advices reached our readers. If lavish outlay, unsleeping vigilance, and unbounded faith in the liberality and discernment of the reading public, will enable us to make a Journal which has no superior in the accuracy, variety, and freshness of its contents, THE TRIBUNE shall be such a Journal.

To Agriculture and the subservient arts, we have devoted, and shall persistently devote, more means and space than any of our rivals. We aim to make THE WEEKLY TRIBUNE such a paper as no farmer can afford to do without, however widely his politics may differ from ours. Our reports of the Cattle, Horse, Produce and General Markets, are so full and accurate, our essays in elucidation of the farmer's calling, and our regular reports of the Farmers' Club and kindred gatherings are so interesting, that the poorest farmer will find therein a mine of suggestion and counsel, of which he cannot remain ignorant without positive and serious loss. We sell THE WEEKLY to Clubs for less than its value in dwellings for waste-paper; and though its subscription is already very large, we believe that a Half Million more farmers will take it whenever it shall be commended to their attention. We ask our friends everywhere to aid us in so commending it.

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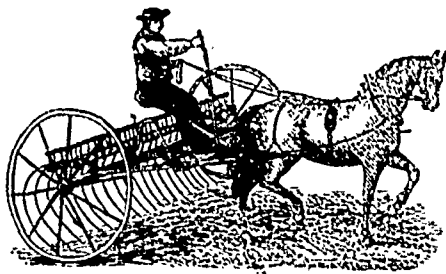
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Will do more work, easier, cleaner, and faster than the common rakes. It does not gather dust in any way. Will rake over rougher ground. Is light and strong, well-made and nicely finished. The teeth are fine spring steel, independent of each other, and will yield to pass obstructions without bending or breaking. The best in use. Furnished with or without Plaster Sower attachment or Hay Tedder. For references, &c., send for circulars.

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GEO LESLIE & SONS, Leslie P.O., Ont.

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Markets.

Toronto Markets.

"CANADA FARMER" Office, April 11th, 1871.

The produce and provision markets continue dull, and there is little change to note in prices, which we give below at wholesale rates.

FLOUR AND MEAL.

Flour—Superfine, \$5 75 to \$5 80; Spring Wheat, extra, \$6; Fancy, \$6; Extra, \$6 25 to \$6 50; Superior Extra, \$7. Oatmeal—\$5.75 to \$5.80. Cornmeal, in small lots—\$3.75 to \$4. Bran, in ton lots—\$19 to \$20.

GRAIN AND SEED.

Wheat—Spring, \$1 35 to \$1 40; Spring Midge Proof, \$1 35, Soules, \$1 40 to \$1 45, Treadwell, \$1 35. Barley—No. 1, 70c to 71c; No. 2, 60c to 64c. Oats—52c to 53c. Peas—85c to 90c. Rye—80c.

FEEDS.

Clover—\$4 25 to \$5 75. Timothy—\$4 50 to \$4 75. Alsike—\$6 to \$7. Flax—\$1 75 to \$2. Hungarian—75c. Millet—75c. Tares—\$1 25.

HAY AND STRAW.

Hay in fair supply, at \$10 to \$15. Straw, scarce and in demand, at \$8 to \$10.

PROVISIONS.

Beef—6c to 7 1/2c. Mutton—8 1/2c to 9 1/2c. Apples—\$2 to \$3. Potatoes—Per bag, 80c to 90c. Poultry—Turkeys, 85c to \$1 50, Chickens, per pair, 50c to 75c; Ducks, per pair, 75c to \$1. Pork—Mess, \$20, Extra Prime, \$18. Bacon—\$1 1/2c to 10c. Ham—10c to 12c. Lard—11 1/2c to 12c. Butter—12 1/2c to 22c. Cheese—12c to 13c, Reesor's Stilton, 18c; Royal Arms, 17c. Dried Apples—6c to 6 1/2c. Hops—Superior, 16c to 17c, Ordinary, 7c to 10c. Salt—Golerich, \$1 35. Dressed Hogs—\$7 00 to \$7 50.

THE CATTLE MARKET.

Deeves (live weight) \$3 to \$6. Sheep from \$3 50 to \$9. Calves from \$4 to \$16. Lambs from \$3.50 to \$5.

HIDES AND SKINS.

Hides—From 8c to 8 1/2c. Sheepskins—Green, \$1 50 to \$2; Dry, 60c to \$1 75. Calfskins—12c. Wool—26c to 31c.

PROVINCIAL MARKETS.

Montreal.—Flour—Extra, \$6.50 to \$6 90; Fancy, \$6.50 to \$6.55. Welland Canal Superfine, \$6 10 to \$6 20, Superfine No. 1 Canada Wheat, \$6.20 to \$6.50; No. 1 Western Wheat, \$6.15 to \$6.25; No. 2 Western Wheat, \$5.85 to \$5.90. Ashes—Pots, \$5.90 to \$6; Pearls, \$7.30 to \$7.40. Peas—Per 60 lbs, 95c to \$1.

London, April 4.—Spring Wheat, \$1.20 to \$1 30 Red Fall Do. \$1 15 to \$1 25, White Do. \$1 25 to \$1 30 Barley, 50c to 55c. Peas, 75c to 85c. Oats, 46c to 48c. Corn, 80c to 85c. Rye, 65c. Dressed Hogs, \$6 50 to \$7. Hay, \$7 to \$10.50. Grass Seed, \$4 to \$5. Clover Seed, \$4.50 to \$5.25. Apples, 60c to \$1. Potatoes, 60c to \$1. Turnips, 20c to 25c. Green Hides, inspected No. 1, 9c; do. No. 2, 8c; do. No. 3, 7c. Sheepskins, 50c to \$1 12 1/2; Dry do., 14c. Fleece Wool, 28c to 31c. Tallow, 5c to 8c. Cheese, factory, 10c to 12c; do., dairy, 9c to 10c. Eggs, \$12 1/2c to 14c. Butter, in rolls, 22c to 25c; Do, tub, 10c to 12 1/2c.

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THE CANADA FARMER is printed and published on the 15th of every month, by the GLOBE PRINTING COMPANY, at their Printing House, 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 orders for the paper are to be sent to

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