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THE CANADA FARMER

VOL. II. No. 4.

TORONTO, CANADA, APRIL 15, 1870.

NEW SERIES.

The Field.

Early Spring Work.

Although March but lately held stormy sway, the busy time of the tiller of the soil is already upon him, and as work well begun is easiest finished, it will be well for him to make his preparations as early as possible. While the weather is still unsuitable for out of door operations, and the Frost King holds fast his grip, much can be done in the barn.

SELECTING AND CLEANING SEED should now be attended to. We have before spoken of the importance of having only the best seed to sow. Let everything intended to be used for this purpose be selected and cleaned with scrupulous care, every light seed and fowl weed being driven out. The fanning mill is not used half as much as it should be, and too often the work is delayed so long that when the time comes it is but half done. Let a calculation be made of the exact quantity of grain or grass seed required for every field to be sown, and the quantity made up only of what has been carefully run through the fanning mill, and if necessary hand sifted, and put up in bags and labelled to show what field it is to go to. Then when the time comes for seeding, there will be no confusion and loss of time about the matter. This done, attention must next be given to the

IMPLEMENTS.—The ploughs, harrows, cultivators, &c, should get a good overhauling to see that they are all in proper order, and if necessary any repairs made. Brighten up the mould-boards of the ploughs with sand and water, and give a coat of crude petroleum to the woodwork, to prevent the rain from soaking in. See that all the clevises, whiffletrees, trace-chains, and other small things so often

needed when work commences, are in good order, and put together in a place where they can be easily found when wanted. Have the harnesses all made sound and tight, and let them be well oiled.

MANURE.—Anything intended to be used as a portable manure, such as land plaster, bone dust, salt, etc., should be stowed away in the barn, or some out-building proof against wet, to be ready on hand when the time comes for its use.

As soon as the spring thaw sets in, and while the land is yet too wet to be worked, is the time to get the barn-yard in order. Have all the manure made during the winter forked over, and thrown or drawn into a covered shed, or if that is not to be had, into large heaps round the sides of the yard, so as to leave a clear space in the centre, and the stables, byres, etc., free from fowl obstructions. The heaps should be so made as to be high, and with perpendicular sides, to prevent the stock getting on them. As they are made, it will be well to throw six inch layers of muck, or even loam earth, about each two feet thickness of the manure heap. The whole can then be covered with the scrapings of the bottom of the yard. When that is done, cover the whole centre of the yard with a fresh layer of muck or earth, to absorb urine and the washings from the manure heaps, and that again with clean straw, so that the stock can enjoy cleanliness and comfort out of doors when the mild days come, and confinement gets irksome, just before grass is ready. This last layer will help to make manure for the fall, or the late sown turnips.

PEAS are usually the first crop sown. See that your seed is free from bugs. If not, it is much reduced in value, though many of the germs may still remain, but they will produce little, weak, spindling plants. Get the best and most produc-

tive kinds, such as the "Crown" or "Daniel O'Rourke." Even if it should cost more for seed, an extra fifteen or twenty bushels per acre will much more than pay for an increase of double in the price of the seed. This crop is always a paying one.

SPRING WHEAT comes next in order. A good deal will be grown, notwithstanding the low price at which it sells. Indications point to a serious loss from winter-killing in the autumn sown wheat this year, and it would not be well to leave the country with a short supply of the "staff of life." Be sure to brine or lime the seed to prevent smut. Let the land be made deep and mellow.

BARLEY.—The failure to realize good prices on last year's crop, resulting from lack of quality, will, no doubt, discourage many, and those who do grow the crop this year will reap the benefit of higher prices next Fall. This crop requires a rich warm soil rather than a deep one, and the more its roots can spread near the surface, and yet find plenty of food, the better will it succeed. Still, barn-yard manure is seldom good for it, unless old and very finely composted. It is better applied to the soil through the previous crop, in roots, potatoes, or corn, or, as is done by some first class growers, thoroughly incorporated into the soil early in the autumn. Barley should not be sown too early, in fact, not till the weather has become settled and warm, and the soil acquired a temperature sufficient to ensure rapid germination of the seed, and a quick, steady growth of the plant after germination takes place. The shorter the time it occupies the ground the better will the crop be likely to prove. Superphosphate or very fine bone dust is a most excellent and profitable manure to apply to barley, say at the rate of 100 lbs. per acre if drilled in with the seed, or 200 lbs. per acre if sown broadcast.

OATS.—There is much to be made on this crop, especially by the class of farmers who sell by measure, have their lands overrun with thistles, and wish to propagate them by growing a late ripening crop. Of late much interest is being taken in the matter of introducing new varieties of this grain, supposed to be of more productive quality than the old sorts, but notwithstanding the stories told by interested parties of the large yields given by some of the new kinds, as the Surprise, Norway, Excelsior, and others, we have doubts if any of them are better even in this respect than some of the old sorts, while some of them, at best, are of very light weight in proportion to their bulk. Oats are a crop always sure to give large returns on good soils with proper culture—things seldom accorded them.

POTATOES will probably not be grown to such an excess as they were last year, resulting in such very low prices. The very early sorts, if grown near the cities and towns, and planted sufficiently early to mature by the end of June or first of July, are most profitable, though rather too troublesome a crop for the better class of large farmers, who will naturally value their time higher than to be peddling out early potatoes in the market. Arrangements might, however, be made to sell the crop in bulk to some enterprising dealer, who will take the trouble of doing the marketing.

CORN.—Those who can grow corn to advantage should not neglect to get their land for it into good condition and fine tilth as early as possible. Good crops, if not the very best, are most certain on a strong stiff sod or clover ley, first heavily spread with barn-yard manure, and then ploughed under somewhat shallowly, say 4 to 6 inches, and planted to corn not later than the 24th of May. Corn requires at least 100 days from the time of planting to fully ripen, under favourable circumstances, and it is most desirable to select varieties that will ripen in that time if possible. By care in selecting the earliest ripening ears each season, and planting only the seed from them, there is no doubt something might be done towards obtaining earlier maturity in this crop.

CLOVER AND GRASSES.—Clover seed is scarce and expensive, yet it will be poor policy to neglect sowing, or to give but a thin seeding, on that account. The most of failures to get a stand we think due partly to want of using enough good sound seed, but also greatly to the want of having the land in good tilth, and neglect to cover the seed when sown. Barley is undoubtedly the best crop on which to

sow clover, as the land given to this crop is usually the cleanest, richest, and best prepared of any. Sow the seed immediately after the last harrowing in of the barley, and cover by dragging once over the surface, crosswise of the last harrowing, a bush harrow made of the tops of some trees, bound together at one end, and spreading out at the other; a slight chain and whiffletree is attached, and one horse does the work. This plan will cover the seed lightly, which is all that is needed. A smart rain coming on immediately after the clover seed is sown will often cover it enough, if the soil is friable and in good tilth. If it is desired to make a strong wheat soil into meadow land, timothy alone, or with very little clover, is best, and it can then be sown either on winter wheat immediately after, or just when the snow melts, or on a spring crop of grain directly after seeding. No artificial covering is needed for timothy. For permanent pasturage to be used for stock, we would much prefer leaving out both timothy and red clover, and sowing a mixture of several kinds of grass seeds, with the addition of some five or six pounds per acre of the small Alsike clover. In this case the grass seed must either be sown on a barley crop, or on land specially prepared exclusively for the purpose, and be covered in with the harrow.

Stock must now be well looked after, and have some roots, in order to prepare them for turning to grass when it is ready, and so prevent scouring. The horses must be kept on dry provender, and in solid condition, to enable them to stand the hard spring work. Cows should not be allowed to roam about the yards, except for two or three hours a day when dry, nor sheep to get drenched in rain storms. Sheep generally get the first to grass, cattle after, and horses not till their work-days are over. Do not be in too much of a hurry to get the spring ploughing done, and so keep men and horses at work in the rain; and especially avoid turning over the soil when it is so wet as to pack as it leaves the mould-board.

Science and Farming.

In a late article under the head of "What has science done for the farm?" a short history, or rather a very brief sketch, was given of the way in which phosphatic manures came to be introduced into England. Things are not yet arrived at that state in Canadian farming when more than a slight sketch is admissible on these subjects. Matters are progressing, however; crops are failing, assistance to the farmer is demanded, and assist-

ance can only be had through the aid of science.

While the search after phosphates was progressing, until not only the shambles, and ancient deposits of bones, but even the old battle fields, were diligently searched and rifled of their contents, and all ground up and converted into superphosphate, or simple bone dust, science had shown that there were other sources of ammonia to be found than the guano islands. The liquids resulting from the distillations of gas works were found to be specially rich in this substance, and the conversion of these liquids into ammonia, in one shape or another, now forms an immense business throughout the civilized world, wherever gas is used as a means of light.

The immense plains in different parts of the world which yield nitrate of soda, and also the various sources of nitrate of potash, were most industriously laid under contribution. The waste of every animal production was equally searched for and husbanded; old cloth and woollen goods gone too far for the shoddy mill; the refuse of the shoddy mill itself; the remains and refuse of slaughter houses; enormous quantities of the refuse of fish after the extraction of the oil; every animal substance which by the aid of chemicals could be put into such a state as to be concentrated and conveyed, as an article of merchandise, from one point to another; all are now utilized, and by scientific aid are converted to the use of the British and European farmer. But the mainstay and aid to the manufacturer of chemical manures has been sulphuric acid; this, from its solvent action and powerful affinities, and from its cheapness, is employed on every occasion, and the sulphur which was formerly used chiefly for the manufacture of gunpowder, and the destruction of human life in war, is now the beneficent agent from which the present fertility of England is obtained.

Fifty years ago, sulphuric acid was an expensive chemical agent, useable only for special chemical purposes, and considered cheap at ten times its present price. Now, it is an object of every-day use, not only in the chemical laboratory, but in all manufactories, and on many farms, and the home manufacture of superphosphates is now very common in Britain. Indeed, no moderate farm of any pretension is to be found where its use is unknown. It was at one time manipulated by chemists only, and even by them with dread. Now it is used on a large scale by men only one degree above common labourers, and by its potent aid matters are unlocked from stony substances totally inert in their natural state, but which afford the highest possible assistance to the farm when separated and rendered soluble. Formerly the only source of potash was the ashes of burnt wood; now the feldspar which is so plenty in some forms, and indeed in most forms of granite rock, is profitably used to obtain potash manures. Almost all the soda of commerce is obtained by the action of sulphuric acid on common

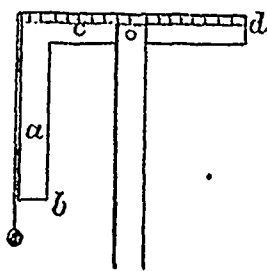
salt, and the latter in its various modifications now enters largely into the formation of chemical manures. Salt and lime mixed together and turned over for three months form the most active substance known for reducing vegetable matters and farm-yard manures into the substance usually known as rotten dung." These matters, when mixed with lime and salt so prepared, decay in one fourth of the time they would otherwise take to fall into the most profitable shape as manure; and the action of these chemicals does not cause a loss of ammonia, or other fertilizing salts, to any serious extent.

Science has also pointed out to the farmer the benefits of liquid over solid manure; the necessity of keeping our heaps and reservoirs of manure from the leaching action of the rains; the reasons for the necessity of rotation of crops; and, indeed, it may be fairly claimed for science, that, through its aid, the average production of grain per acre throughout Great Britain has doubled itself within the last twenty years. VECTIS.

Practical Drainage

BY ALAN MACDOUGALL, C.E.

The next step towards a scientific instrument for obtaining levels is somewhat similar to the one mentioned before. Instead of having the head fastened on like a T, it has a square fastened on, with a plumb-bob attached to the perpendicular

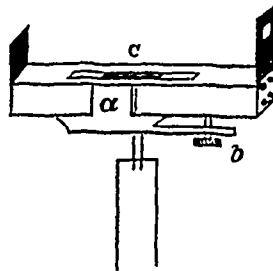


arm. The square may either be fastened on firmly, or have a thumb-screw to allow of its being loosened or tightened, as may be required. The plumb-bob is made to hang down the side of the arm *a* in the same way as it hangs on the centre line of the T, and when it just touches the arm *a*, the other arm *c* is level. Some persons use this square with the arm graduated to inches, then by throwing it slightly off the level, a grade is obtained. For example, if the arm *c* were thrown a quarter of an inch off the level, and its length were 24 inches, then a quarter of an inch on 24 gives one inch in 96, or a grade of 1 in 96. This needs very careful handling and calculation, and for this purpose the arms must be of the same length, so that whatever distance is required to be laid off can be accurately measured. If not, and the arm *a* were 12 inches long, while the arm *c*

were 24, let the point *b* be shifted a quarter of an inch, the point *d* will move through twice that distance, so that instead of obtaining a grade of 1 in 96, the grade obtained will be 1 in 48.

If it be desired to use this square and bob for laying out grades, the upright must be firmly set in the ground, and after the grade has been laid out, the arms must not be touched, in case any derangement to the grade takes place. It will answer pretty well on a perfectly calm day, but if there be any wind to swing the plummet about, then this method of laying out a grade is not very practicable.

Considerable accuracy in levelling can be obtained in the use of the underectioned instrument. It is often used in levelling long distances for drains. It works with sufficient accuracy to be recommended as the nearest approach to an engineer's level that it is necessary for



a drainer to have. It consists of an ordinary spirit level, having an eye-sight raised above each end. At one end the sight is higher than the other, and is furnished with a piece of stained glass, or some other material of the same height as the other sight. The level is made to fit into a brass frame *a*, which acts as a spring to adjust it to the level position *c*, by means of a large-headed screw *b*. A stud, projecting from this frame, is to be firmly pushed into a gimlet hole on the top of a short staff, which is firmly driven into the ground. When not in use, the level can be carried in the pocket, as it is of no weight, and the staff used as a walking stick. It is preferable to have the frame with the spring attached to the level, for the convenience of carrying it. Even a better method than having the spring *a* and adjusting screw *b* is to have the stud fastened on the bottom of the level and made to fit on a core working on a ball and socket joint, like the working of a surveyor's compass on the "Jacob staff." It is rather more costly perhaps, but makes a more permanent level, and it can be very accurately levelled by the hand.

In every case, the sighting is to be done in the same way, which is similar to that

formerly explained in the use of boring rods, the target on the graduated rod is to be moved up or down until it cuts the line of vision, and the difference in heights of the readings on the staff and the height of the level above the ground to be taken, which difference will be the difference of level between any two points.

Tile Drainage.

To the Editor.

SIR,—A circumstance has come under my notice respecting a tile drain, to which I should like to draw your attention, and that of your numerous readers.

The drain leading from the cellar of Mr. F. Coleman, in this neighbourhood, became completely blocked up. On examination, it was found that the fibrous roots of an apple tree, growing some thirty feet from the drain, had entered the crack between the tiles, and had become a mass so solid that the water could not pass. I enclose a portion for your inspection.

The drain was laid three years ago, by a professional hand from England. The tiles were two inch bore, laid four feet deep.

There is an orchard of ten acres in this vicinity, with tile underdrains. It has two main outlets, and in the spring does not run two barrels a day from either outlet.

I have a young orchard to underdrain. With these facts before me, it would be useless to attempt it, unless I can hear where tiles are manufactured with collars, or to connect in some way to prevent one falling below the other, as I find the mice or moles have undermined mine.

I think, in laying a drain around a cellar, elbow tiles would be an advantage, as they require to be close to the wall.

What do you consider the best drain for a cellar? W. T. CROUCH.

Virgil, Jan. 31, 1870.

REPLY.—The roots look very much like grass roots; probably when the tiles were laid they were covered with turf—a very common practice, and the turf being put on with roots downward has caused the mischief. It is highly improbable that a tree in three years could shoot roots down into four feet of depth, when it was thirty feet away from the drain, however wet and soft the subsoil might be. The subsoil must evidently be soft sand (will Mr. Crouch inform us, and also say if the land was wet before it was drained?) which was wet and full of water before draining; in such cases there are frequently grasses that are called sub-aqueous, which cause a good deal of trouble to the drainer, often requiring a drain to be lifted and relaid after three years. The fault of the ten acre orchard seems to be the same as Mr. Coleman's, but we should like to know more about the condition of the land before draining, subsoil, fall, depth of drains and when laid, and distance apart. Tiles

being undermined is something new to us. In the absence of details we can only say that a farther knowledge will probably show that there has been shockingly bad work somewhere. Collars are not required except for wet sands. For the drainage of a house cellar, tight pipes are the best, with spigot and faucet joints, which ought to be rammed hard with strong clay. Elbows can be got for these. For other cellars, where there is plenty of fall for the water, tiles do very well with collars. They ought never to be laid close to a wall, but about three feet from it. Elbows are not made for tiles, nor are they required, as tiles can be laid to a small radius.—Ed.

Thistles

To the Editor.

SIR,—I should like to say something encouraging for your correspondent "Enquirer," if possible. But unless he has overstated his weakness, or has represented himself as being more impatient of difficulties than he really is, I fear I shall not succeed. I have no new method of thistle-killing to suggest; but if I assure him that the old ones may be used effectually, and that he takes a mistaken view of the expere (arising, if he will forgive me for thinking so, from a limited apprehension of the science of agriculture), and then exhort him to firm resolve, patient perseverance, and methodical effort, I may perchance be so happy as to induce him to reconsider the following passages of his letter.

Says "Enquirer," "Recently I went to look at a very beautiful farm, but almost every field was badly infested with thistles;" and again, "if I cannot get a farm without thistles, I shall decline one at all, unless there is a less expensive way of dealing with them than the one 'Vectis' proposes."

My own feeling would be, if a very beautiful farm were offered to me, and I wanted to buy one, that its being infested with thistles would not, *alone*, be an obstacle to the purchase of it. For—assuming that the expression "very beautiful farm" means a farm with great natural advantages, and, perhaps, some other striking qualities—since I could destroy thistles by the ordinary methods of good tillage, but could not so readily find a substitute for natural goodness of quality, I should deem it wiser, on the whole, to buy the beautiful farm, thistles and all, than to trust to the precarious chances of finding for sale a good farm without thistles; for the men of Canada, so far as my observation goes, do not think it "smart" to sell farms of any sort while they are in good condition.

Your correspondent objects to "Vectis'" thorough summer fallow, on the score of expense, which he estimates at fifty dollars per ten acres, or five dollars per acre. Why, Sir, that farm which, whether be-thistled or not, is not made to undergo at stated periods some sort of effectual cleansing, must needs fall into very miserable plight, and it is to be

feared that few of us can go far from our own homesteads without seeing various degrees of exemplifications of this necessity. Upon the choicest and cleanest land some such treatment is absolutely essential. It is everywhere admitted that these operations are the most expensive of all ordinary agricultural work, and for that reason they are, as we see, either altogether shirked, or very inadequately performed by not a few farmers. Hence, thistles and all the tribes of weeds. Hence, too, ten or fifteen bushels of spring wheat from land which would produce thirty or thirty-five, and twenty bushels of fall wheat from land which, even without general and thorough underdraining, would produce forty or forty-five bushels. In this fallow section of the Canadian farm really lies, after all, the true and most cogent reason why writers in the old country are able, when they have a purpose to serve by it, to almost ridicule our pretensions to living in a grain-growing country, and to speak with contempt of the outcome of our harvests.

The spirit of enterprise, which is not seldom disastrous in other departments of life, might with far greater safety be adopted by farmers who hug the present dollar, or put it out at usurious interest (itself a source of infinite mischief), and lead a dreary life upon their half-tilled farms, uncheered by those hopes of improvement which stir the minds and stimulate the energies of other men; while their sons, discouraged by the prospect, canter off to simper out their lives behind a counter, with a noble country like this around them. How different in England and Scotland, where, to become a farmer, like his father, is the ambition of nearly every boy reared on a farm; to whom an announcement on leaving school that he must now prepare to seek a livelihood in a city, is the shattering of dreams and hopes of entering upon a country life. Happy for Canada when so healthful an ambition shall take possession of her young sons. It is for their fathers to bring that state of things about; there is room for them at home.

SYSTEMATICALLY ENCOUNTERED.

Resuming the subject of the thistle difficulty, I now return to the letter of "Enquirer." Here we have a gentleman, whose letter gives evidence of a good education, hesitating to enter upon a "very beautiful farm,"—no, not hesitating—"declining" to take a good farm because of the thistles.

I am far from believing that bare fallowing is the most profitable treatment within reach, though it is the speediest as regards thistles, and involves the smallest present outlay. I only insist here that no farm can prosper without some such outlay, and that five dollars per acre, if it can be done for such a sum, is a mere bagatelle. I suppose the summer fallow to be, as is most convenient, the first step in a systematic rotation of five, six, or seven years; each crop in the course is supposed to, and really does, profit by it. Divide, then, five dollars by five, six, or seven

or by whatever number of years may constitute your course, and see how insignificant is the charge per annum per acre, as compared with benefit accruing.

So much for the summer (or bare) fallow. But supposing that for a bare fallow hoed-crops of Indian corn and roots be substituted as the first member of the course. "Enquirer" would not be alone if he objected to this also, as being too expensive; yet, when all the charges upon a field of Indian corn and roots, thoroughly ploughed, hoed and manured, (considerable as those charges are), come to be apportioned amongst all the succeeding members of the rotation (as it is obvious they ought to be) who would not incur the outlay who had observed the wonderful renovation thus brought to the farm? Thoroughly ploughed and hoed, and well manured, the land must be, for upon these depend the force of the whole argument in favour of the plan, and eventual profit to the farmer. And this process, comparatively expensive though it be, apart from the destruction of thistles, apart from its effects upon succeeding crops, and regarded only as a means of making beef, mutton and pork for market, is a paying enterprise in the long run. Happily, at this day, the number of farmers following out such a system because they have proved it to be profitable, renders argument and demonstration unnecessary. Where it has long been well practised, their farms and their fortunes will demonstrate. Let the sceptics go see.

Under a judicious rotation and careful general culture, neither thistles nor other weeds have much chance of regaining their ascendancy between the periods of hoed crops or bare fallow, several opportunities occurring of disturbing them. We will suppose a hundred acres of land divided into six sections, for the purposes of rotation, and that the succession of crops is as follows:—

Section 1. Sixteen acres Indian corn, potatoes, turnips, bare fallow. As much of the land of this section as can be well manured to be under hoed crops. The unmanured remnant, if any, to be bare fallowed, and the absence of yard manure to be supplied, at the earliest opportunity (which will occur at a subsequent stage of the course), by ploughing under a fall crop of clover; unless sheep can be folded upon a crop of unmanured white turnips, or, still better, upon white turnips manured with bone dust, superphosphate, or guano.

Section 2. Sixteen acres wheat or barley, seeded with clover (thickly sown), and timothy or some other grass.

Section 3. Sixteen acres hay, which may be twice mowed if thistles abound, in which case the first mowing should be very early.

Section 4. Sixteen acres pasture. If the land be not very poor, a good crop of clover may still be expected here, which may be ploughed under on that part of the land which did not receive yard manure where fallowed.

Section 5. Sixteen acres peas and oats.

The pea land (and the oat land if both crops can be removed early), offers an opportunity of waging successful war with thistles, especially if the land be very dry, which is often the case, by immediate cross-ploughing and ridging up before winter.

Section 6. Sixteen acres wheat or barley.

It will be found convenient that these sections should adjoin each other as much as possible in the order of their numbers. Under this plan, or one akin to it, "Enquirer" might soon make havoc with the thistles which disturbed him so much, and would become practically convinced that the expense and trouble of the first section had been successfully applied with greater results than the mere destruction of thistles, and that the systematic operations through which they and all other weeds had received so great a shock, had also been the means of enriching his land, to say nothing of the simplification in the management of the farm thus introduced.

PRACTICALLY SUBDUED.

In illustration of the efficacy of systematic course of culture recommend me to give the results of my own practical experience.

Seven years ago, at the age of fifty years, I gave up a business in the heart of a British city, and, with the slightest acquaintance with practical agriculture, came to this country and plunged forthwith in *medias res*, as a "book farmer." Since the first year, which was one of not much method, I have followed the course indicated in the former article as closely as the wretched circumstances of the farm would admit of; always, when I could not absolutely adhere to it, bending my arrangements towards it as a cherished object of full eventual attainment; and the amelioration thus effected may be indicated by a comparison of the former and present yields of the principal crops. My plans have again been much deranged by the purchase of an adjoining farm (grievously be-thistled), which I am bringing, bit by bit, under the rotation, along with the second course upon the old farm. The contrast of the two farms is painful to look upon, *mais nous changerons tout cela.*

	First Year.	1869.
Spring Wheat.	10 bushels.	26 bushels.
Barley.	24 "	50 "
Oats.	30 "	61 "
Peas	12 "	Destroyed by blight.
Turnips.	250 "	650 "
Indian Corn.		100 in cob.

A large portion of the wheat land produced this year over thirty bushels per acre. The oat crop was so heavy as to be all lodged, the yield being greatly diminished thereby, besides much waste in the field.

Of the clover, for want of an accurate estimate, I can only say that the first year's growth was ridiculously small, and that the quantity last year was exceedingly great. The above improvement has been brought about by one course only; the same treatment will,

of course, continue effectual for many years, and may be rendered yet more so by thorough underdraining.

The tone of "Enquirer's" letter seems to indicate that he has been badly smitten with that spurious economy which prevails amongst us so largely, to the great injury of this country, and to which I have already alluded. It has had, as sickness will have, a depressing effect upon his nerves in view of minor difficulties. I must venture, however, to present to him one more draft upon his slender stock of faith in high farming. The best results cannot be reached (in the sense of profit) under the best scheme of tillage, unless all the Indian corn, oats, peas, hay, and roots are consumed upon the premises, or an equivalent be supplied by drawing manure from the towns, and the use of artificial manures. It is manure thus made that renders hoed crops profitable in fattening animals, and in the raising of grain crops. To sell them off the farm without an equivalent in return is really selling a part (the best part) of the farm.

I feel so much indebted to Stephen's "Book of the Farm" that I must, before I close this communication, very earnestly recommend it to all farmers. It may be got at Toronto. It is costly, but so it would be to open a gold mine. The most experienced farmer may read it with pleasure, and consult it with profit. The young farmer should devour it.

In conclusion, I will express my conviction, that generous and systematic treatment of land, a knowledge of principles, a courageous, persevering, energetic application of them, and capital, are essential to good and really profitable farming; that the more of these qualifications a man can bring to the work the less needs he to be frightened at thistles at starting, or to yield to misgivings about satisfactory pecuniary results; and that he who has them not in a fair degree should consider well before he commits his fortunes to the exhausted lands of the old clearings; for more or less exhausted or run out, and greatly out of condition, a large proportion of them are, especially when they come to be offered for sale.

BOOK FARMER.

Potato Produce.

Mr. Frederick Membery, of Bath, Ontario, sends us the following notes of his experience with a few varieties of potato during the past season. He says that with him the yield was as follows per acre:

Gleason.	600 bus.	No rot.
Cuzco.	630 "	One-third rotten.
Early Goodrich.	500 "	No rot.
Garnet Chili.	200 "	No rot.

Of the Early Goodrich the account was not so correctly kept as of the others, the potatoes being dug as they were required for use throughout the season. About seven pounds of Early Rose were planted, which yielded five bushels, none rotted.

Chemical Manures.

Some time since, we drew the attention of our readers to a series of experiments then progressing in France, which were intended to ascertain the relative value of chemical manures, as compared with the best barnyard or stable manure, not that it was intended either to deny or doubt the benefit to be derived from farm-yard or stable manures, but for the purpose of finding substances that might supplement and assist their action. In France, as in Canada, farm-yard manures are not produced in sufficient quantity to meet the requirements of the farm, and the originator of the system, a Mons. Geo. Ville, determined to go back to first principles, and see if he could not ascertain what the true source of fertility consists in. He therefore established a series of experiments, in which he at first made use of burnt sand, well leached and washed, so as to deprive it of every particle of natural fertility and vegetable organization, as his ground, and proceeded to use as his manures for that ground the pure mineral salts of lime, potash, soda, nitre, and the phosphates. These were reduced into a soluble state, and added to his burnt sand in various proportions, until he by almost innumerable experiments adduced the fact that grain and other crops of every kind could be produced in full perfection without one particle of earth or clay, or of natural manure or decaying vegetable matter, but with purely chemical elements alone. He proceeded with these experiments for many years, until he satisfied himself of the particular chemical substance wanted by each class of plants; and concluded, moreover, that while each class required certain quantities of all the above elements, they required especially a large portion of some one of those elements. He ascertained the exact amount each kind of crop would extract of these various chemical elements from the soil of an acre of land, and having ascertained the expense at which the chemical elements could be produced, he determined the cost and the profit of a crop so manured, as compared with a similar crop grown with ordinary manure. As no man with less than the fortune of a prince could afford the time and means to carry out such a series of experiments, it was made a national matter, and the funds requisite were supplied by the Emperor of the French. Meantime, the projector of these improvements made his plans known in a small treatise, most unfortunately entitled "High Farming without Manure," and he set forth the results of

his labours in such elaborate and high-flown language, as to elicit from many of those practical people who read the work unmitigated ridicule, while many were deterred from looking further than the title page and the first chapter or two, and then threw the book aside as altogether theoretical, and unworthy of attention. Those, however, who looked deeper into things, found amongst the verbiage of the work a great deal of valuable information and material for thought.

Mons. Ville, having the full support of the French Emperor, proceeded from his theoretical experiments to those of actual practice; he selected the poorest farm he could find, divided it off into sections, and having by analysis ascertained exactly of what the land consisted in its then present state, proceeded with his practical trials. One set of compartments he devoted to the successive cultivation (year after year) of one special sort of crop. Wheat followed wheat, barley followed barley, peas followed peas, and green crop followed green crop year after year, without rest or intermission. He now brought to bear the information he had acquired in his burnt sand, and added each year the general chemical manure, composed of all the before mentioned chemical substances, but only in so small a proportion as to produce the first growth of the crop, whilst in addition to the general manure, he added an increased quantity of the special element which the particular class of plants of which the growing crop consisted would abstract from the soil.

Thus, for his wheat and cereal crops he added to the soil, in addition to a certain quantity of general manure, a considerable portion of ammonia—ammonia and the various matters which produce it being the special manure for wheat and cereals generally.

To the land on which he sowed peas, beans, clover, etc., he gave the same proportion of the general manure, and in addition a quantity of potassa or potash—potash and its equivalents being the special manure for the pulse crop.

To the land on which he intended to raise roots he applied the same general manure, and in addition the phosphates—those and their producers being the special manure for all roots.

We are informed that, after a few years' experience, he could so exactly apportion his materials that he could take out a full crop of any particular kind, leaving the ground in so poor a state that without the annual addition it would not produce more than it would have done

when he commenced to use it in its original state of poverty.

He also contended that by his system nothing was lost. If he applied a little too much of the general or of the special manure required for the use of the crop that year, it remained in the soil as available for the next year's crop.

As against this, however, must be taken into consideration the leaching away by the rains and natural waters of the soil of the excess of any mineral salt which had been added in so large a proportion as not to combine chemically with the elements of the soil. When combined, the roots of the plants alone could extract it. If in too great proportion, the roots of the plants seized on the overplus before they drew on the chemically combined elements of the soil, and thus is shown the importance of only adding to the soil soluble chemical manures in the spring and summer, while the roots are in full action, and can avail themselves of it; whereas the same soluble matter added in the winter season or in the fall passed off during the leaching of the winter's rains, and was lost to the agriculturist. On the other hand, chemical manures, not specially soluble, might be added to the soil at any time, and produce the proper effect in due season.

In addition to the before described compartments of the experimental farm, another set of compartments was applied to the production of the same kind of crop, sown and cultivated in the usual manner, but manured as before with chemical manures; and again other sets of compartments were applied to produce similar crops in a similar manner, but manured with barnyard and stable manure alone; and a last set of compartments was devoted to the production of unmanured crops, which only received assistance from the cultivation and moving of the soil in a state of nature, the use of the bare fallow, and the usual rotations, but always altogether without manure or stimulant of any kind.

This experimental farm was annually inspected by all the savans and acknowledged authorities on farming matters that could be got to look at it, and the results were carefully tabulated and noted in the records kept by Mons. Ville and his assistants.

The deductions drawn established, in Mons. Ville's estimation, the thorough triumph of the chemical manures over those of the barnyard or stable, and that to an extent of from thirty to fifty per cent., the cost of both kinds of manure being taken into consideration as well as the effect.

Not only was this advantage apparently secured, but the additional benefit was claimed that the chemically manured land not having the seeds of plants carried to the soil with the manure, became year after year more free from weeds and extraneous vegetation, while the land manured with ordinary stable and barnyard manure became foul with the weeds arising from the seeds returned to the soil in the manure, and which had not been destroyed by fermentation or moisture.

The latest recorded results are as follows:—

The experiments on wheat numbered 138, and the result in round numbers gave an advance of about nine bushels per acre in favour of the chemical manure, the cost of the chemical and of the natural farm manure being the same.

It was also found that a greater average of good crops annually was obtained from the chemical manure than from the other.

The experiments on potatoes produced similar results, also in favour of chemical manure.

83 experiments produced an average: From chemical manure of nine tons, or 389 bushels per acre.

From farm-yard manure, 7 tons 7 cwt., or 317 bushels of potatoes per acre. (No doubt the French acre is here meant.)

From 160 experiments with beet root (sugar beet) the result gave an amount in favour of the chemical manure of within a few pounds of four tons per acre.

There are now experimental farms of this kind established all over France, in order to convince farmers by actual personal experience and inspection of the advantages to be gained by chemical and scientific knowledge, when applied to farming.

The results in the French colonies of similar operations, conducted on the same principles, have not been less conclusive. The owner of one of the best and largest plantations in Guadaloupe has found that the chemical manures possess the same advantages over ordinary manures in the growth of the sugar cane and other tropical crops that they do in France over ordinary crops—and it would be only multiplying instances to an unnecessary extent to adduce further results.

But it may be said by the Canadian farmer, "What is the use of all this to me? We cannot get chemical manures." In reply we say that information of what is going on in the rest of the world ought to be known to Canadian farmers as well as to every one else; that although we have not now chemical manures at hand, they are every day approaching us; that

the lands all through the Southern States, which have been exhausted by slave labour and improvident farming, are now being daily renovated by these chemical manures; that immense manufactories of these manures are being established all over the States, and an immense amount of capital is being invested in them; that the use of such manures in Canada is inevitable in the course of a very short time, and that the minds of our farmers ought and must be prepared to receive the revolution in agriculture which the use of chemicals is certain to produce.

VECTIS.

Destroying Seedling Thistles

To the Editor.

SIR,—Permit me to make a few remarks on the "Note by Editor" to my previous article on the thistle in the February number of the CANADA FARMER, where it is candidly admitted that the smothering system of "Publicola" may undoubtedly clear a field of one crop of thistles, (which is the only one thing up to the present that has been contended for), but what, it is asked, becomes of the countless myriads of seeds with which the soil is filled? a matter which has hitherto not been discussed. The destruction, or the subjugation, of the parent plant has been exclusively considered. Some even repudiated the idea of the thistle propagating itself by seed; but, happily, this strange notion no longer exists; for we are told in the "Note," countless myriads of seeds remain in the soil to germinate and fill the places of their exterminated parents, and then, "what is to prevent this?" This is a question I am anxious to answer. In the careful and pains-taking experiments recorded by "C" in the June number of 1869, page 201, he says the results of these experiments was "death, root and branch, but seedlings afterwards grew again from seed; but the first and second year they are easily destroyed." Now, had "C" stated how these seedlings are to be destroyed so easily at one and two years old, it would have met and answered the question propounded by Editor. "C" has undoubtedly given a latitude of one year too much for the seedling thistle to be "easily destroyed." A seedling thistle can be easily distinguished from the parent till after midsummer; but after the parent has been cut in the middle of July, or at harvest time, and has pushed up another vigorous bunch of leaves, then from this time the seedling takes rank with the parent, the one cannot be distinguished from the other and the seedling of this year will surely mature its seed the next, but never in the first year. Thus to destroy them "easily" it must be done the first year, and it can be done as well as any other perennial.

Instead of allowing them after harvest to grow on unmolested to the end of the growing season and ripen all their leaves, before

the middle of September the cultivator (not the plough) should be put over all stubbles infested with seedling thistles, and again before the middle of October; the second time it might be done a little deeper than the first. Care should be taken not to miss any portion of the ground. This process will not only destroy existing plants, but will excite the seeds of weeds that are on the surface to grow, which is equivalent to their destruction, whereas the plough would bury all such seeds where they would remain in a state of perfect preservation till they were again brought to the surface. To go over stubbles infested with thistles with the cultivator twice will only take half as much time as it would to plough it, and is practicable for all; and after the thistles have had a second growth after harvest, to be thus cut off twice in the fall will be found far more efficient in the destruction of even the parent plant than ploughing, or even such fallowing as the majority of farmers can afford to give. Twenty years ago I have destroyed long established patches of thistles on pasture land, without ever disturbing a root, only by mowing the tops off, and never suffering them to ripen or mature in the fall. I have also killed out the most obstinate patches of couch grass without disturbing the roots, with only occasional hoeings, so that the tops were never allowed to mature.

Settling in this locality, where thistle growing is a rule in all fields, and if there are exceptions they are unknown to me, and my own land being well supplied, I resolved as soon as I could to try the clover system, and this county being pre-eminently suited for the growth of clover, I felt no demurring about the result. A hundred years ago it was as great a nuisance in England as it is here; but the plan they adopted was just the opposite of that which is here in Canada insisted on. In *Loudon's Encyclopaedia* I find it stated that "the thistle delights to grow in ploughed fields," and instead of fallowing for its subjugation, English farmers seeded the infested fields down into meadows, and so left them for seven years to accomplish that which they as utterly failed to do with the plough as the Canadians do at this day. I would here remark that the thistle cannot increase, or propagate itself, on clover leys or meadows. The seeds that might lodge, or even vegetate in spring, would surely come to nought. It might just as well germinate in a wooden box with the lid on; for without light and air the young plant must die, and in neither of the foregoing cases could it obtain that light and air.

I would challenge any farmer in Canada, to say, or prove, when he laid down a field in pasture, and such pasture should have just two small patches in thistles and no more, that at the end of seven years he had three patches, or even two large ones. Apart from the consideration of the seedling thistle, the plough has been, and is, the most perfect instrument to propagate the old plant by the

roots. In ploughing stubbles or meadows late in the fall, with an abundance of well matured thistle heads, they come in contact with the opposite slice as the mould-board twists them over, and their heads get bent upwards, and a large portion of their upturned roots, just covered with earth, are in the best possible position to throw up several new shoots from the otherwise latent buds. The land so ploughed late in the fall is often in the best possible condition to sow in the spring without farther ploughing, and the result is, a double number of parent thistles, to say nothing about seedlings; and hence, ploughing is the only one efficient method to practical farmers for the successful propagation of the Canada thistle.

I contend that the complete subjugation of this pest by the fallow system is impracticable. It is an old saying as well as true, that "one year's seeding makes seven year's weeding," and it is saying too much on behalf of one year's fallowing that all the seeds of any one plant weed can all be brought to the surface and be excited to growth,—even if the farmer could plough his fallow for twenty consecutive weeks; therefore, I fail to see how the evil is combated and exterminated by one year's fallowing. I contend farther that the admissions of those who advocate the fallow system prove its inefficiency. "C," in the article to which I have already alluded, says, and very truly, "we know that fallowing in dry, hot weather will kill thousands of thistles, but some few old roots remain uninjured, any quantity of seed also remains ready to sprout and grow on being exposed to the air." So that his notion of fallowing did not combat with the seedlings, "the source of the evil." His plan of ploughing the thistles in the middle of June, and then to keep combatting them to the end of the growing season (say four months) is a very serious affair, and not one farmer in ten will, or can, attend to it as prescribed; and if any of the thistles escape, all the labour (or most of it) is lost for that year.

In place of the foregoing expensive remedies, and their more than doubtful success, as proved to demonstration by the advocates themselves, I offer the clover system, which involves no trouble, no loss, nor any doubt in its results, and have answered to the best of my abilities the new element introduced into this discussion, by the query respecting the seedling. In answer to this, I propose that the cultivator be used twice in the fall, instead of ploughing in; after which it is beneficial to plough the land, and this system should be continued so long as the prevailing thistle scourge remains. Without deranging his operations (if he willed it) the farmer could walk over his hundred acres, in five years, with the clover system, when not a seed-bearing thistle would be found in his once disfigured fields; then as to the seedlings, they are, (as "C" remarks) easily destroyed the first, but not the second, year.

PUBLICOLA.

Arnold's Hybrid Wheat.

A limited quantity of these new varieties of wheat, the results of Mr. C. Arnold's carefully conducted hybridizing experiments, will probably be in the market after next season's crop, and we have pleasure in publishing extracts from the report of the Committee appointed by the Board of Agriculture to examine the wheat. The Committee consisted of Hon. D. Christie, Messrs. W. H. Mills and James Cowan, who state that in their opinion the wheats were "really new varieties—cross-bred, and inheriting some of the valuable qualities of both parents; that is, they seemed to have the midge-proof character of the Amber Michigan, while Soules parentage had greatly improved the quality of the grain as compared with that of the Amber Michigan. Another important fact ought to be stated, viz.; the ears of the new varieties were much larger than those of the parent kinds, while they had even more than the compactness of the Soules wheat. The yield per acre was large, being as Mr. Arnold says, 52 bushels per acre. This return was not the result of extra culture; the land was not better prepared than any good farmer would deem necessary for good crops."

A Committee appointed by the North Brant Agricultural Society to examine these varieties of wheat report in similar favourable terms, respecting the size of the berry, the productiveness, hardness, and midge-proof qualities of the grain. Many other agricultural authorities have given equally flattering testimony, and we shall watch the result of more extended trial with much interest. Such experiments as those of Mr. Arnold deserve every encouragement, and in the present aspect of the wheat question, and considering the gradual deterioration of most of the old varieties, the matter is of special importance.

Sugar-Beet Contrasted with Mangold.

Sugar-beet is being extensively cultivated in Great Britain as food for stock, and for this purpose it is fast coming into competition with mangold. A correspondent of the *Agricultural Gazette* says that, as a rule, the sugar-beet does not grow as large as the mangold, and therefore to ensure the same weight per acre more must be grown. To make this plain, he presumes that in an ordinary crop of large mangold there will be from sixty to eighty roots to the perch. Now, in sugar-beets there should be about two hundred roots to the same area. This increase of the individual roots will compensate for their lightness, and the gross yield of the sugar-beet will probably be as great as that of mangold. Already they are running each other pretty close in the Livenham district. The heaviest crop of sugar-beet this year weighed in the gross thirty-one tons per acre. The best crop of mangolds weighed one ton less, or thirty tons per acre. Weighed with out tops the mangolds reached twenty four tons per acre, and the sugar-beets twenty one

and a half tons. The number of mangolds per perch was one hundred; of sugar-beets, two hundred.

These facts and figures point a lesson and indicate the direction improvement should take in regard to sugar-beet. Many a one who remembers the first crop mangolds, with their uncouth roots and coarse large leaves, and contrasts them with the fine stock and small leaves of the most approved sorts of today, will see, at a glance, that the same course of selection and crossing, if needful, must be pursued with the sugar-beet. Among the crops now there are great differences in regard to top and habit. These have been noted by the growers, and most of them are saving their own seed from what they consider the best samples. It is probable that in a few years there will be model crops of sugar-beet, with little, if any, greater development of top than among the best mangolds. Once this is accomplished, the roots may go even closer together, and as, bulk for bulk, they weigh heavier than common mangold, it follows that by-and-by we shall have as heavy, or even heavier, crops of the sugar-beet per acre.

Selecting Seed.

We cannot too strongly urge upon the farmers the importance of exercising a close supervision in selecting samples of seed, especially grain, of whatever crop is intended to be grown.

In the first place, it should be sound, plump and solid, and of the most productive varieties; and in the second, it should be entirely pure and free from any admixture of other grain of the same kind, and the seeds of weeds.

We are no advocate of the plan followed by some, of giving extortionate prices for a fancy article, with some new-fangled name, the merits of which are belauded in highly coloured circulars and advertisements of interested dealers. We believe good seed can be had at reasonable prices from those who, by careful selection, and clean culture, find it pay to dispose of their produce for seeding purposes, and having acquired a good name by honest dealing, are anxious to keep it up.

Above all, use the fanning mill; it is not valued half as much as it should be, and even with the best of seed we would run grain through at least once before sowing.

PRIZE ESSAY.—We have received a copy of an essay on turnip culture, by H. Love, Secretary of the South Huron Agricultural Society. This excellent treatise received, at the last fall show of the Society, the prize offered by the President, Mr. Dickson, for the best essay on the subject, and the author has well merited the honour. The essay is thoroughly practical, and its publication will no doubt promote the interests of agriculture in the county.

Stock Department.

Notes on Canadian Herds.

No. VIII.

About ten miles north of Duffin's Creek station, G.T.R., near Atha P.O., Pickering township, is Burnside Farm, the residence of John M. Bell, Esq., comprising some 200 acres. He commenced his herd of Shorthorns in 1857, with two cows imported from Scotland, along with some of George Miller's, brought out at the same time. They were Jane 3rd, by Sir John (13735), from Young Jane by Strathmore (6547), and Lucy Neal, by Sir Charles (13705), from Young Rose, by Remus (11987), both bred by Robert Syme, of Redkirk. In our account of George Miller's herd, these two were erroneously credited to him. Jane 3rd has gone to the butcher long ago, and left but one female descendant, Jane 4th. Lucy Neal, a fine rich roan cow, still survives, and stands at the head of the herd. She is now in her 15th year, and is a large massive animal of great depth and substance, and has bred regularly up to the present time. Jane 4th, a light roan cow fourteen years old, by Nichol [497], is a fine milker. She has a neat red heifer calf, Ruby, by Highland Chief. Jessie, roan, nine years, is by Young England [822] from Lucy Neal. She is a fine cow, though not so massive as her dam, and has a very handsome red and white heifer calf, Favourite, by Highland Chief. Jane 5th, roan, nine years, by Prince of Wales [578] from Jane 4th, is of good quality and a splendid milker. She has a heifer calf by Highland Chief. Bride, roan, six years, by Charles [118] from Jane 4th, is much of the same style. She has a red bull calf by Highland Chief. Bessie Bell 3rd, red with some white, 5 years, by Clifton Duke 2nd, [133] from Bessie Bell, is one of the best in the herd. She partakes strongly of the Kentucky character through her sire. Mary Gray, roan, five years, by Prior [589] from Jane 5th, partakes of the good milking quality of her dam, while she has good style and substance from her sire. She has a red bull calf, Redcap, by Highland Chief. Jane 6th, red, four years, is by Prior from Jane 5th. She is rather small, though of good style and quality. She has a very fine red bull calf, Grand Duke, by Highland Chief. Pride, white, three years, by Prior from Jessie, is the handsomest animal in the herd, and for her age is very large and massive. She has a roan bull

calf, six months old, Comet, by Highland Chief, and though milking well, is in high condition, and a better representative of the breed, combining size, quality, and style, is not often seen. Tulip, dark roan, two years, by Prior, from Bride, is a large handsome heifer, of good substance. Empress, red roan, fifteen months, by Oxford Mazurka, from Mary Gray, is a beautiful animal of great size for her age, yet neat and handsome. She looks the best of the young ones, and is a credit to her sire. Jessie 2nd, red roan, four years, by Prior from Jessie, is a long-bodied neat cow. Snowdrop, white, four years, by Prior from Jane 4th, is in thin condition from a recent illness, and does not show to advantage, though of high quality. Melody, roan, three years, by Prior from Jane 4th, though somewhat small, is a fine, handsome, neat animal. Rose, red and white, by Valentine from Jessie 2nd, is inferior in quality to the rest of the herd. Miss Ann, roan, two years, by Prior from Jessie, is a large and somewhat coarse animal, that may improve with age. Flattery, white, two years, by Prior from Jane 5th, is promising, though small yet. Daisy, roan, one year, by Highland Chief from Snowdrop, is a very promising young one, as is also Jenny Lind, a roan yearling, by the same bull, from Jessie 2nd.

The bull now in use is Highland Chief, 6884, a dark red bull of fine style and good substance, bred by J. M. Hill, of Harristown, Ill, U. S. He is by 11th Duke of Airdrie, 5533, from Margery by Afton, 1173. He is now three years of age, was imported by Mr. W. Miller, jr., of Pickering, and sold to Mr. Bell early in the fall of 1868. Previous to this Prior, [589] a roan bull bred by R. A. Alexander, of Kentucky, had been used by Mr. Bell. He was by The Priest [743] from Fanny by Fantichini (12862), and traces back through his sire to Earl of Dublin (10178), a bull of the best milking strain of shorthorns in England. The introduction of these two Kentucky bulls into the herd seems to have been the means of improving it greatly, and taking the whole herd together, it is seldom one meets with one of more level and evenly good quality throughout, combining both size and style with good milking properties.

The stock get no feeding beyond hay and turnips, are kept in good breeding condition, and have never yet been shown at Provincial Exhibitions, but will be this year.

A few Cotswold and Leicester sheep are kept on the farm, and several Clydes-

dale colts were running in the straw-yard.

While in Markham, we did not forget to call on George Miller, the patriarch breeder of shorthorns in Canada. The young ones we saw last fall are in fine thrifty condition, looking most beautiful. Already this season's calves by Bell Duke of Oxford have begun to come in, and present indications show the likelihood of another splendid lot of shorthorns by him.

Mr. Miller showed us a very fine Berkshire sow he has lately obtained from Mr. H. Cochrane, and some Dorking fowls just out from Scotland. He has sent two of his finest heifers by Bell Duke, to 11th Duke of Thorndale, at Compton.

The American Short-horn Herd Book.

The ninth volume of this important work, indispensable to the short-horn breeder of the neighbouring States, and exceedingly useful to many in Canada, has just been issued by the well-known editor and publisher, Lewis F. Allen, of Buffalo, N. Y., price \$10. It is handsomely got up, and bound in cloth, in two parts, containing together over 1,000 pages. Part I. contains the pedigrees of 1959 bulls, from 7439 to 9398. Part II. has the pedigrees of about 3,520 cows, making altogether in the volume some 5,380.

The accumulation of so large a number of pedigrees for publication in so short a time, Vol. VIII. having been published scarcely two years back, affords pretty strong proof of the activity prevailing at present in the pursuit of short-horn breeding in the adjoining States of the Union. And there appears very good reason too for such activity, if we may judge from the highly remunerative prices at which high-bred short-horns have been sold in numerous instances of late. Mr. Allen in his preface says:—

“Prices for choice animals were never so high, nor were such animals ever so eagerly sought by our enterprising farmers and breeders as during the past two years. Some bulls and cows have been imported from England during the past year at a cost varying from \$2,000 to \$5,000 each, in gold coin. Several cows, of American breeding, have been sold in our own State, at \$3,000 to \$7,000 each, and bulls at \$1,500 to \$6,000 each. Concurrent with their progress here, short-horns never sold at such high prices in England as now, nor need these be considered FANCY prices alone. Fashion, no doubt, to some extent prevails in the

choice of some peculiar strains of blood and styles of form; but when the prices we have named are paid by experienced breeders, and those among the best judges of quality and blood in cattle, it may well be believed that they find their interest in so doing. Men of education, wide intelligence and ample capital, in all our Northern and Middle States, engaged in various pursuits other than agriculture, are among our most enterprising cattle breeders, as well as those whose vocation is confined to their farms alone, and in this noble pursuit they find both profit and pleasure. More and better than this, every good cattle breeder in the country is a public benefactor.”

Vol. IX. contains an unusually large number of illustrations, about seventy, several of them being portraits of animals which have recently changed hands at very high figures. We need only call the attention of breeders to the fact of the publication of the volume to ensure a ready demand for it among those interested.

The Barmpton Short-horns.

Even at this distant day, a short account of the celebrated herd of Robert Colling, the descendants of which are now so widely scattered wherever short-horns are known, will be interesting.

In 1783, Robert Colling left his brother and took the Barmpton farm. Some of his earliest stock came from Mr. Milbank of Birmingham. These were noted for their excellent grazing properties.

From one of the original cows of this stock came the Yellow Cow, by Punch (531); from her came by Favourite (252) the dam of the celebrated “White Heifer that travelled.” She wastwin with White Bull (151), and never bred. From the Yellow Cow came North Star (459), also by Favourite. He was a grand bull, with good hair and fine handling. From her came the cows Venus and Clara, and Diamond, a small bull of perfect symmetry. Venus bred the bull Adonis (7), and a heifer that was sold young. Clara bred the bull Eryholme (1018) and another bull and heifer.

Robert Colling had four families from which the majority of his stock descended. Of these the Yellow Cow above mentioned was one. The second was the Wildair or Hubback tribe, which came from the same source as Hubback (319). Of these were Juno, Diana, Wildair, and Nonpareil, the last considered the finest cow ever seen. Nonpareil bred Sweetbriar, by North Star (459), and Marka

(418) a bull used by Mr. Bates. Sweetbriar bred May Rose, that went to Ireland, and Formosa, that bred Mr. Torr's Flora, from which the Flower tribe, the finest at Aylesby, have descended. Wildair bred Caroline, Harold (291), Phoenix, Emperor (1013) and three other bulls. Phoenix went to Charles Colling, of Ketton, and there bred the celebrated bull Comet (155), sold for a thousand guineas. The third was the Beauty, or Punch tribe, originally from Mr. Best, of Manfield. Of this were Beauty, Golden Pippin, Clarissa and Old Daisy. Beauty was from the same dam as Punch (531). Golden Pippin was by North Star, and went to Mr. Whitaker, where she bred Non-such, and both then went to Mr. Adkins, of Milcote. Old Daisy bred Ben (70) and Twin Brother to Ben (660) afterwards sold to Mr. Booth. The fourth was the Red or Moss Rose tribe, of which the origin is unknown. Red Rose was own sister to the American Cow, the first female named in the now fashionable Cambridge Rose line. This cow was bred by Robert Colling, and sold by him when a yearling, to go to America. She came back again, and passed into the hands of Mr. Bates when 17 years old, and bred Red Rose 1st, by Yarborough. Red Rose bred Moss Rose by her own sire, and proved a regular and excellent breeder, most of her calves being bulls. Among them were Miner (441), Midas (435) a fine large bull that made 1,100 guineas for Mr. Colling, and finally went to Mr. Wiley, of Brandsby, and got for him but two calves, Midas, 1230, and the famous Grazier (1085). She also bred Baronet (62), sold for 350 guineas, and Pilot, (496), sold to Mr. Booth for 270 guineas, and a heifer Rosette. Moss Rose bred Barmpton (54), Lancaster (360), and Young Moss Rose. Barmpton was a small-sized but beautiful roan, neat, wide backed and compact. He got splendid stock, said to be better than North Star's. He was by George (275), a magnificent bull that fell and broke his neck when young. Lancaster, a white bull, was of fine quality, but narrow, thin, small and lanky. He was let cheap as a yearling, but got most extraordinarily good stock, that became the talk of the country. This, coupled with the fact of his being from so grand a cow, brought Mr. Colling 621 guineas for him. Young Moss Rose went to Stockeld Park, where her descendants still remain.

Besides these leading families, Mr. R. Colling had several heifers got by Favourite (252) and Wellington (680), from cows bought from his neighbours or at the

fairs, most of which became progenitors of many fine short-horn families. Among them may be noted Cowslip, from which came the Ursula tribe of Mr. Rich of Didmarton, Empress, Princess—from which came the Gwynne tribe—Strawberry—from which came the Mantilini tribe—Jessy and Jewel (twins), Cicely, White Rose, Lady, Old Dinsdale, Countess, and Young Charlotte, besides several others, some not named.

Hubback (319) and Manfield (404) were the first bulls used, succeeded by Broken Horn (95), Punch (531), Favourite (252), Comet (155), Phenomenon (491), Wellington 680, besides several bulls of his own breeding, as he bred to very close affinities, using Favourite very extensively for years.

At the sale at Barmpton, in 1818, eleven of the Red Rose tribe, including Lancaster (360), brought an average of £269 3s. 6d. each, and thirteen of the Wildair tribe £142 17s. 6d. each.

Housing and Feeding Cattle

To the Editor.

SIR,—Having seen in the CANADA FARMER some articles about housing and feeding cattle, and believing that in some particulars I can suggest improvements, I send you an account of my operations.

For the accommodation of my cows I raised a house, sixty-four by thirty-four feet within, in the side of a clay bank. There is a cellar of stone and lime, eight and a half feet high, divided by a wall across, fifteen feet from one end, so as to make a cellar for roots. It is ventilated by four pipes on three sides, six by six inches, through the floor and walls, with slides to cover them. The floor is drained into a well of good sweet water. There is a ring of brick laid in cement round the well. The spare water is let out through a pipe. The floor is laid with cement. The floor of the large cellar is also well drained and laid with cement; and besides, about two and a half feet of the walls are cemented to keep bad water from the well. There are four stone pillars and two cedar posts in the cellar to support the floor above, and the purlin posts. The door for taking out the manure is level with the floor. There is no frost in the manure. The cellar will hold five or six months' manure; and the small cellar will hold roots to supply twenty-eight cows all the season, at the rate of twenty pounds daily each. The beams for the first floor are cedar, resting on the walls, and on the pillars mentioned as being in the cellar. There is some care needed in placing these beams to answer the different inclines of the cattle floor. The floor is of two inch pine. There are four rows of cows, seven in each. There is a passage the length of the house. There are two doors in the side. Fourteen cows go in at

each door, and stand with their tails to each other. The upright scantlings that form the stalls are fastened to the floor below and the beams above. The feeding troughs are made, the bottoms of two inch pine and sides of one and a half inch pine; the divisions between them being four and a half feet high: the inside of the feeding box is sixteen inches wide, the front eight inches high, the back thirty-one inches above the bottom. The back of the box inclines outward seven inches, this is important, as it prevents the beast wasting the food. There are pieces of three or four inch scantling put between the floor and the bottom of the box. The distance between the front of the feeding box and the gutter may be six feet; the two gutters, with the open space between them of fifteen inches, will be three feet eight inches. The gutters are two inches below the floor; where the cow stands pieces of three inch scantling are put across the open space of fifteen inches, and a two inch plank, twenty-two inches wide, covers it; all excrements pass into the cellar below this plank. There is no trouble to keep the cows dry and clean, and no waste of manure; there is no excess of water in winter. Some black earth or dry earth, not much, is wanted in summer to absorb the excess of water. There are five windows in the back of the house, and three in the front, with the two doors. There are six openings, thirteen by fourteen inches, through the upper floor, and pipes set on them that reach up through the bay. In the roof there are two windows and two ventilators, which draw off all smell or bad air, and in addition, there is a window high up in each gable. The windows are all alike, six lights, eight by ten, and boards, ten by twelve, on hinges. The house is a frame, with cedar sills, the posts being eight by eight inches, and sixteen feet high; covered with good boards—the joints covered with dressed stuff, one inch by three, nailed every two feet. It is lined inside with inch boards, and filled in with tanners' bark. The floor above for hay is eight and a half feet to the roof, and thirteen and a half feet to the purlin beams; it will hold hay for the twenty-eight cows. The roof got two coats of coal tar, and the siding two coats of fire-proof paint. Hay may be taken in at either end with a horse-fork. There is a space above the turnip. Bar, fourteen by thirty-three feet, for preparing food; in it there is a pump, a turnip-cutter, a bin for holding broken grain, and three boxes, five feet by seven and four feet deep, to hold the food.

After a good deal of experience, and some study and calculation, I have come to the conclusion that the following quantities and mixture of food are about right for a fair-sized cow giving milk: Twenty pounds clover hay, twenty pounds turnips or beets (fine cut), two pounds bran, five pounds broken oats, two pounds pea-meal (equal altogether to 15 pounds hay). Some small cow will eat less, and large ones more. The mixed food being placed in the box, put in

the same amount for every cow: the box will hold feed for thirty cows. Damp it well with water, and tread it down, in forty-eight hours it will ferment and be hot; then feed out. I use a barrow with two wheels that holds twenty bushels; the man draws it easily along, and with a bushel box divides it in a few minutes. If any cow wants more, give a little dry hay, and as much water as she will drink, three times daily. I, for some years, fed about sixty pounds Swedish turnips, five pounds meal, pea and oat, with fifteen pounds hay. Steers or dry cows would not take any water; the bulk is too much, and there is too much cold water in the turnips. This is about equal to thirty-nine pounds hay. There is one hundred pounds oil-cake wanted (it costs delivered three-quarters of a cent per pound), two pounds daily three or four weeks before calving, and two pounds daily a month after calving, when full food should be given, as described above, until cut grass is plenty.

I am satisfied with the method, having used it nearly four months. The rent for each cow, at ten per cent., is four dollars per annum. This may be high, but the convenience is all one can desire. The house is free from smell, well lighted, and has water and room for the roots and hay to feed the winter through. The cellars cost near twenty-five per cent. of the whole. There is a hay-cutter on the upper floor: the cut hay is let down through the floor into the large boxes; it just wants a steam-engine to crush 2,500 bushels of grain and cut 140 tons of hay, with straw for litter. If all litter were cut, the manure could be taken out and spread on the surface of the field, or ploughed in, as might be desired. My other cow-house holds thirty cows, but is not so convenient; but I hope to improve it soon.

JOHN ROBERTSON.

Bell's Corners.

Live Stock at the Provincial Exhibition

To the Editor.

Sir,—With your permission I desire to call the attention of the members of the Council of the Provincial Agricultural Association to a few matters in connection with the annual exhibitions of the Association, which I think deserve their consideration. Probably no one will deny that the live stock department is one of the most important features, if not the most important, in connection with these exhibitions. Let our Provincial Fairs be stripped of the fine display of horses, cattle, sheep, and swine, which has made them so justly famous, and who will deny that their greatest attraction would be gone. It is safe to say that the interest taken in them would be small compared with what it is, and the attendance of visitors would be correspondingly reduced. Now, I think a little consideration will suffice to show that it is the worst used department in the whole exhibition. For the reception of the articles exhibited in the other departments a grand building is erected at an immense expense, where those articles are exhibited to great advantage,

and men are paid to take care of them, and all this without the first shilling of expense to the exhibitor; while for the live stock, which is infinitely more valuable and just as liable to suffer from exposure, temporary sheds are provided, which are often uncomfortable and inadequate; and if a box stall is required for a horse or a bull, an exorbitant rent fee is charged.

Besides these things, feed is only provided at extortionate prices, often for an inferior article, and parties are not allowed to sell feed on the ground at their own prices, because the Board has granted that special privilege to special parties, who are allowed to monopolize the business. How very different is this from the arrangements at the State Fairs of our neighbours, where an abundance of good hay is provided by the Association for the stock, without any charge; where stalls are free, and railway freights both to and from the fairs are also free. If this interest is so important, surely it ought to be encouraged. I write not in the interest of the leading breeders and exhibitors alone, for I know that they can afford to pay their own expenses, that by showing a large number of things they can secure enough prize money to pay the immediate expense of attending the fair, besides finding a good market for their stock; but I plead in the interest of the new beginners in this enterprise, and I hold that if greater encouragement were given there would be far more exhibitors, and, consequently, more interest manifested. According to the present arrangement, if a person living a considerable distance from the place where the fair is held desires to show a horse or a bull, he finds that if he is successful in winning a first prize, it will barely pay the expenses of transportation and feed, and if he fails to win a prize the whole expense is lost to him, and thus it is that many are deterred from competing. The expense of preparing stock for exhibition is considerable, and the railway charges for transportation are also heavy, to say nothing of the risk of their being injured or killed.

Why cannot the same arrangement be made with our railways that are made by the State Societies across the lines with their railways? Canadians who take stock to the State Fairs can travel by rail with their stock to almost any point and return, free of all charges. Surely the immense extra passenger traffic which these events bring to the railways is sufficient to pay for the carrying of articles to and from the exhibition, and allow a good margin for profit. When we consider that it is these that make up our fairs and draw the crowds, surely some liberal policy ought to be adopted to draw out our young farmers and breeders. I claim that in all fairness and reason stock ought to be carried to and from the fairs free, and that stalls and hay ought to be provided free. All, I believe, even if they do not claim as much as I do, will agree with me that ample and good accommodation, and food at a low rate, should be provided.

YOUNG FARMER.

Raising Calves.

To the Editor.

Sir,—In your article under the above heading, which appears in your issue of the 4th inst., I agree with, the introductory portion, but must take exception to your directions for feeding and care when approaching maturity:—

1. In advising to give skimmed milk, and afterwards either that or sour milk mixed with meal.

2. In having them *come in* as cows in their third year.

When skimmed milk is given to a calf, it acts as a purgative, which at once sickens the animal, and causes it to refuse food for two days, and for a long time every dose of this unnatural food is followed with like results.

A continual drenching of the calf retards its growth at the outset, and an inferior animal is to be expected. The addition of the meal only increases the indigestibility of the mixture.

I have been for several years in the employ of noted stock raisers in Scotland, and their system was to allow the calves selected for raising to suck the mothers twice a day (they being separated the rest of the time). This was continued till they were six months old. After each removal of the calf, the cows were carefully examined to see that no milk was left, and if any, it was taken from them.

During the summer, the calves were placed in a field of growing grass or clover, and freely supplied with water. Nothing else was given.

When weaned, and during the cold weather, they should be provided with a warm stable, and regularly fed three times a day with good hay; every morning the rack to be cleaned before being supplied with fresh hay. About a pailful of dry provender to four calves to be given every twenty-four hours, or as an occasional substitute, two sheaves of oats.

During wet and stormy weather, they should be watered in the stable. It is not good policy to allow lambs to be with them as you advise, as calves often get into the habit of eating the wool of these, which would be obviated by separation. During the second winter it is still advisable to keep them separate from the older cattle, while they should be housed and liberally fed. By this method the growth is never checked nor retarded, and if it were followed we should not have so many scrubby specimens of cows in the country.

Again, you defeat your object to secure good cows by allowing them to go to the bull so early as to have them *come in* in their third year.

The growth is not completed till the third year, and it is mistaken policy to have them bear and give milk before their fourth year, or till they have arrived at maturity. This, with the skimmed milk course, is in my opinion the great cause of our inferior stock.

Our winters here are more favourable for cattle raising, when they are properly fed and sheltered, than the changeable winters of Scotland, and if they get the justice there given them, we should have at least equal if not superior animals.

MALCOLM MCGREGOR.

Roxborough, Feb. 24, 1870.

NOTE BY ED.—Our article on this subject was not intended to apply to the case of breeders of high class thoroughbred short-horns, or in cases where the value of the milk is a secondary consideration to the value of the animal intended to be raised in order to fetch a fancy price. In their cases it is quite usual to allow the calves to suck the cows, or even where that course is not pursued (and it is a most undesirable one in many respects), they are allowed nothing but new milk. But it would be folly to expect the farmers, as a class, to devote all the new milk of their cows to the sole purpose of raising calves, when it is worth more for making butter. As to skimmed milk being continually purgative, our own experience, as well as that of several other breeders to whom we have lately spoken with reference to this subject, is that it is not so. If given to a calf accustomed to suck, or have new milk warm from the cow, it would in many cases prove purgative for the first two or three days. We have found that if warmed to a proper degree it does not purge to any appreciable extent. The meal should be boiled, and then stirred in; but then few will take that trouble, and we fear few even take the trouble to heat their skimmed milk to a proper degree, and it is giving the calf the milk cold that causes all the trouble our correspondent speaks of.

In regard to the other point, opinions may well be allowed to differ: but our object was to show that animals that had been well fed and cared for would attain maturity, and so be fit to breed, earlier than those that were neglected and stunted. A few days since we saw a very fine shorthorn cow, now six years old, that has bred six calves at single births, the first one coming when she was eighteen months old: and we think few breeders of pure stock in this country could be satisfied to wait for their heifers to reach their fourth year before breeding.

Shrinkage on Hogs.

We have as yet received but very few answers to our enquiries on this subject. The cause may lie in the lateness of the season at which they were made, the greater portion of the hog products having probably been marketed. Another is the difficulty experienced by farmers in getting fat hogs correctly weighed at just the right time.

A firm in Pennsylvania, largely engaged in fattening hogs of the Chester White breed, gives the shrinkage or loss between live and dressed weight of a large number as follows: On hogs weighing over 600 pounds, loss 12 pounds per 100 of live weight, or less than one-

eighth. 300 to 600 pounds, 14 pounds per 100, or less than one-seventh; 150 to 300 pounds, 16 pounds per 100, or less than one-sixth.

They say common scrub hogs will lose more, and that there is a wide margin for profit between feeding improved breeds and common hogs, more than sufficient to pay the extra prices demanded for animals of the former.

A Mr. Eckardt, of Markham, gives the live weights of two eight months old Berkshires he killed as 302 and 253 pounds respectively. Each gave twelve pounds of rough lard, and weighed besides 250 and 245 pounds, showing a loss of less than one-tenth. Another Pennsylvanian gives an account of a Chester White hog he killed that weighed 1,065 pounds alive, and 1,005 pounds dressed; less than one-sixteenth of loss. An Ohio man gives the live weight of a twenty-three months old Chester hog at 985 pounds; dressed weight 870 pounds, a loss of one-ninth.

We hope to get some more answers, and shall reserve any further remarks on the subject till it can be more fully investigated, but so far the evidence is in favour of what we have always maintained, viz., that the amount of shrinkage insisted upon by drovers and packers in buying fat hogs alive is much too great for the interests of the farmer who has really good hogs to sell.

Barren Cows or Heifers

It is no untrifling cause of complaint with breeders that valuable cows or heifers sometimes fail to breed. Such instances rarely occur, except in the cases of animals that have been pampered, that is, brought to a high condition by means of extra feeding or "forcing," as it is called. Such animals need not be condemned as barren, as under good management they can be brought to breed. It is well to reduce them in flesh about the beginning of summer, by turning them into a hilly short pasturage for a time. A long drive will often prove beneficial. Sometimes a change from one herd or farm to another some miles away proves a sure remedy after every other has failed.

Delicacy of constitution may sometimes be the cause, from too close in and in breeding, and where the same bull has been used in a herd for some years he may fail with some of the younger cows and heifers, in which cases resort must be had to another bull that is in no way related to the herd.

Bulls that are too closely bred, or that are fed too much on rich carbonaceous food, frequently prove unreliable stock getters. They should get albuminous food in preference, such as peas, oats, barley, and the leguminous grasses. In fact, anything very saccharine or sweet is undesirable. A bull should always be kept in good condition, but should not get fat, and the more he is used the more need there is of giving him oats or barley.

but he should never have Indian corn. The forcing of bulls when young, in order to get them into high condition and early use, is sure to prove injurious, and result in greatly diminishing their vigour. Neglect to give salt at least once a week is often a cause of barrenness among cows and heifers. A bull should never be allowed to run with the herd; that is one great point often neglected, and results not only in inducing barrenness, but also in producing abortion among the females. It is one of the most common, yet most pernicious practices indulged in by breeders, more from carelessness, and a desire to save trouble, than want of knowledge.

Steaming Roots for Stock.

A subscriber from Yarmouth, Nova Scotia, asks us to give, through the columns of the CANADA FARMER, the least expensive mode of steaming roots for hogs, on a small scale.

Among other experiences of farm husbandry, one of our regular contributors has carefully tried and practised the following plan both in England and Canada, and having at command small means, the annual expenditure was kept very low. His account is as follows:

For a small inexpensive rig for steaming roots for stock, I have used and would recommend an ordinary potash kettle, if the farmer has one, (of course a better boiler would do its work quicker,) set in a brick arch, with plenty of fire room, and about ten feet of ascending chimney, and a cover fitted into the kettle, made of two-inch dry plank, well jointed, and nailed firmly on scantling to prevent warping. A bar of wood passes across the cover and another crosses this, and each end is firmly secured to the "lug" or propelling support of the kettle, (there are usually four of these "lugs.") by a piece of iron hoop formed into a band, and well hooped on to each projecting end. These bars will firmly hold the cover in its proper place. All round the edge of the cover you must caulk cotton-batting or flax, driven well into the joint, so as to be steam-tight. This is very easily done, as there will be no pressure. A barrel with one head out is placed on the cross, and communicates, by means of a cock, with the kettle below. The barrel is to be filled with water; and the boiler below, as the water evaporates, is supplied from this source.

A two-inch wrought iron or tin pipe, well wrapped over with old rags to keep in the heat, rises by means of an elbow, from the cover, and turns at once over the side of the kettle, and with another elbow fits into a short piece of pipe, called a nozzle, that enters the centre of the back of the puncheon in which the roots are to be steamed, close to the bottom, and underneath a perforated false bottom placed in the bottom of the puncheon, on which the roots rest. This is supported by two-inch bearers arranged across the puncheon head to receive the weight of roots,

and must also allow of the steam freely passing all over the under side of the perforated false bottom. To get rid of the condensed water, without letting the steam escape also, requires a small piece of lead pipe, bent like the letter v. The upper end enters the puncheon, below the false bottom, and the lower end is left sufficiently long to be below the double, thus forming a syphon; half inch lead pipe will answer well. The water, as it condenses, will flow out of the lower end, without allowing any steam to escape. The puncheon is supported by an inch bar of iron passing through the lower part about fifteen inches from the bottom, and must be about six inches longer each side than the width of the puncheon. Two posts are driven into the earth, one on each side, with notches cut in the top to allow the projecting ends of the iron bar to rest in.

A square hole is cut in the upper head of the puncheon, to admit of the roots being filled in with a shovel, and emptied out. The piece that comes out forms a good cover to go back again, if a piece of blanket or cotton cloth is placed over the hole before the cover is put in, and this serves to keep in the steam and is sufficiently tight.

The puncheon is now in its place, the pipe connected with the nozzle, and a piece of cotton wound round it to keep it steam-tight. The syphon pipe, or leak water, is inserted on any convenient side. The boiler is filled with water, and the barrel on the top also. The fire is lighted underneath, and the whole arrangement is complete, with the exception of covering the lid of the kettle with about two inches of sand, which will prevent any small escape of steam, and keep in the heat. We now remove the square cover and fill the roots into the puncheon. If potatoes are used, they want no cutting; if mangolds are wanted, or turnips, they must be cut into pieces about the size of a goose egg. The puncheon can most readily be supplied with a handbarrow, with handles at each end, and the same barrow serves very conveniently to remove the roots when steamed. To do this you must place the barrow in front of the puncheon, disconnect the pipe at the back, and gently upset the puncheon (it will readily turn on the projecting ends) and all the roots will run out into the barrow. I used, for many years, an ordinary wine cask, that held about 120 gallons; and if good steam is used, with good dry wood, about one hour would steam the puncheon full of roots: but, of course, the time required much depends on the draught, mode of setting chimney, and general arrangement.

The foregoing plan is cheap, efficient and simple, and within the reach of any farmer fit to keep a pig. Of course frost must be guarded against, wherever steam works are used, as cocks and pipes will burst if left full of water. The potash kettle, however, will not be injured by frost. In setting the kettle allow plenty of room for fire all around and underneath.

Cattle Stalls and Manure.

To the Editor.

Sir,—Referring to the letter of "Byreman," and your answer in the February number, I perfectly agree with you in your method of stabling and fattening stock, but you do not finish the story, and say what is to become of the manure after being taken from the byre at such short intervals. Is it to be thrown out to be wasted by the rains, or put under covered sheds to accumulate till wanted in the spring, or carted at once and spread on the frost on the fields where wanted, or piled in conical heaps in the fields?

Allow me to point out what appear to be the objections to these different methods, with a view to promote discussion, and also to gain information on this most important subject. It is unnecessary to speak of the first plan, as every intelligent farmer knows that it is ruinous. If put under sheds till spring, it is only farmers dunging small portions of land that can possibly delay their work till so late. If to be carted at once to the fields, it would be necessary that a farmer, by the plan you recommend, should have sufficient stock to keep a cart constantly employed, and even then, continuance of bad weather would cause great inconvenience. As to whether it should be made in heaps in the fields, or spread directly on the ground, I think, judging from the contradictory opinions of eminent chemists, and first-class agricultural journals, it is hard for the ordinary farmer to decide what to do.

I should propose a modification of your plan; the space behind the cattle should be so arranged as regards depth and width, that sufficient manure should be allowed to accumulate to make it a day or half a day's work for the teams to cart it to the fields to be dunged. I cannot see any objection to this, but I have never tried it.

I cannot agree with you in your objection to box feeding, having tried it for a number of years. Although living on a cold, exposed hill, we often have to leave the doors open to prevent the cattle from sweating, but I do not altogether believe in box feeding, as you cannot economise space sufficiently, and I believe that straw should be all turned into food, instead of bedding. I consider that the simple question of floors for stables in your February number involves one of the most scientific questions the farmer has to deal with in the present day; for if we can make and cart our manure to the place we want it all winter, it does away with one of the greatest drawbacks to Canadian farming. I hope that this subject will be taken up and discussed by able hands. A FARMER.

Windsor, N. S.

SALE OF STOCK.—Mr. Ashworth, of Belmont, Ottawa, has sold his shorthorn bull, The Viceroy of Belmont, got by Sweetmeat (20924) out of Souvenir of Thorndale by 2nd Grand Duke (12961), to the Hon. B. Seymour, of Port Hope.

Veterinary Department.

Symptoms of Navicular Disease.

The professional veterinarian generally has little difficulty in detecting a confirmed case of navicular disease, but it is often puzzling to the casual observer or amateur, and mistakes in consequence are often made. The horse is always more or less lame, and the lameness is greatest when the animal is first brought out of his stable in the morning, at which time he generally walks with a tripping action, gradually becoming freer in his movements after exercise, and when warmed up to his work he appears to go almost sound. When standing he favours or points the affected foot, and when both feet are alike diseased, he keeps pointing with one foot, then pulls it backwards and favours the other. In severe cases, he seldom stands firm upon both fore feet at one time. The heels become contracted, and general atrophy or wasting of the foot is also the result. This is easily noticed when the disease is confined to one foot, for it becomes considerably smaller than its fellow. The toe of the shoe is also worn quickly down from the peculiar action. The muscles of the limb also waste, and more particularly the muscles on the outer part of the shoulder; and this wasting is often taken for the cause of the lameness, when it is only the effect. It is this condition of those muscles that often misleads as to the true nature of the disease, and the horse is supposed to be lame in the shoulder, when he is in reality a confirmed cripple from navicular disease. These symptoms may continue the same for a considerable time where the horse is moderately worked, but if he is hard wrought, they become more aggravated, until the horse is completely useless for any ordinary work, and particularly so when he has to carry weight. If the foot is taken up, and the sole at either side of the frog struck gently with a hammer, he at once evinces pain, shown by pulling his leg quickly and forcibly upwards. Pressure with the thumb upon the tendon immediately behind the frog will cause him to act in a similar manner. The above are the general symptoms of navicular disease. Exceptional cases are met with, where the foot is not contracted, and also where the horse points but very little.

The treatment of confirmed cases of this disease can only be of a palliative nature. In recent cases, however, a complete cure may be effected. The horse

should have rest, the shoe be removed, the sole moderately thinned down, and the toe shortened; then poultice the foot, or stand the horse in moistened clay, or a water bath. This treatment should be continued for several hours daily, and the horse afterwards be put into a stall or roomy horse box. After a time, blisters around the coronet are also beneficial, and even frog setons; and in horses that are incurably lame, the operation of neurotomy may be performed, but should only be attempted by a person conversant with the structure of the foot and limb, and only resorted to in inveterate and incurable cases.

Symptoms of Acute Laminitis.

This severe disease is indicated by the excruciating pain exhibited by the suffering patient. The animal is almost unable to move, and when forced to walk, he progresses in a very peculiar manner, by placing his hind legs well forward under the body, in order to relieve the fore feet. The breathing is increased greatly in some cases to such an extent that on a casual glance the animal might be supposed to be affected with an acute attack of pleurisy. The circulation is very much quickened, the pulse beating sixty to eighty per minute, the temperature of the feet is raised, and the pastern arteries are throbbing. The muscles of the shoulder and flank are quivering, and in some instances the horse perspires freely. The bowels are usually costive. If you take the horse by the head, and attempt to force him backwards, he draws the fore feet along the ground. If you attempt to turn him around, the effort to do so will almost cause him to fall. When standing, he keeps his fore legs well out, throwing the weight upon the heels, and the hind legs are brought far under the body, giving to the loins a somewhat arched appearance. This symptom frequently misleads as to the seat of the disease, and the horse is supposed to be affected in the region of the kidneys, when he may be suffering from an acute attack of laminitis or founder.

Inversion of the Womb.

Mr. Richard Serson, of Fulgrove, enquires what is the proper treatment to be adopted when cows "put out the calf bed," and mentions also that he has noticed "cows, and especially heifers, in high condition, swell very much about the navel for a considerable time before they calve

Inversion of the womb frequently follows the convulsive efforts in the expulsion of the fetus. The treatment in such cases is to return it as quickly as possible. It should

be washed with a little tepid water, and in cases where the placenta or afterbirth is not detached, this should be carefully removed; then support the womb by means of a strong towel, and endeavour to return it by gentle pressure. When the womb is swollen, it might be advisable to scarify it lightly and freely before attempting to return it, but this should be done with caution, and had better be entrusted to a competent veterinary surgeon. Having succeeded in returning the womb into its proper situation, the next object is to retain it there. This is best done by elevating the hind quarters, and applying a pad to the vulva for some little time, which may be secured to a surcingle placed around the abdomen, and behind the shoulder.

Swellings under the belly are often the signs of a good milker, and rarely do much harm. By giving a less quantity of food, and a few doses of the iodide of potassium, their removal will be facilitated.

The writer of the above communication complains that he has written before without receiving any reply. We can only assure him that his previous communications have not reached us. We would, moreover, particularly request our correspondents in general to send communications to the editor distinct, and on different paper from letters enclosing money or treating merely of matters of business.

Hydatids in Sheep's Brains.

To the Editor.

SIR.—I have recently lost two good ewes within a week of lambing. In each of them were found two fine lambs. The sheep both died on the fourth day after the first indications of disease, and the symptoms being peculiar and precisely similar in both cases, my foreman very carefully examined the last one, to find out, if possible, the cause of death.

I send for your inspection a large grub, which was found close to the brain, and which, I have no doubt, caused death.

The symptoms were, first, a nodding movement of the head, and grinding of the teeth, as if in great pain, then a trembling of the fore legs, and finally, loss of strength in the hind legs, the sheep falling on its haunches, and being quite unable to stand.

They continued to eat, as usual, the first, second, and third day, but took nothing the fourth day, when they died. S. G.

REPLY.—The grub shown us appears to be of the kind frequently met with in the brain of sheep that are affected with the disease known as "sturdy," or "gid." It is called the *Conurus cerebri*, and it is believed to be produced from the ova or larvæ of the tape worms which are dropped from dogs. The minute ova or larvæ may be taken into the mouth from off the pasture or other food, and so taken into the stomach. They are exceedingly minute, enter the circulation with the chyle, and thus gain access to the brain

by means of the blood. The soft, loose texture of the brain is favourable to their further development. In the brain they usually become enclosed in a membranous sac. From their situation, they give rise to various symptoms, often such as stated above, whilst in other cases the head symptoms are more alarming and severe—the animal reels about, wanders from the rest of the flock, and in some instances keeps continually turning round and round, plainly showing that the brain is the seat of disease. The hydatid frequently causes partial absorption of part of the skull bone, immediately over its situation.

The remedy in such cases is to remove the hydatid, which is often successfully accomplished by the use of a small trochar and canula. In operating, the head must be carefully examined, to find the seat of the hydatid, which is frequently indicated by a softening of the bone, as already stated. The skin is dissected back, and the trochar and canula introduced; and it is also necessary in some cases to use a small syringe to draw out the hydatid. The after treatment consists in bringing the edges of the wound together, and using any simple dressing. In many parts of Britain the shepherds perform this operation in a very dexterous manner, but we would scarcely recommend it in totally inexperienced hands.

There is a disease known as "grub in the head," of which the seat is not the brain, but the nostril, or nasal sinuses, and which is caused by the larvæ of the gadfly. The irritation consequent on the presence of this parasite is very great, but is not usually attended with cerebral symptoms, nor is the complaint commonly fatal.

Singular Local Disease.

To the Editor.

SIR.—There are a couple of farms in my neighbourhood on which every horse that is employed on them any length of time dies through the effects of a disease, stated by veterinary surgeons and others to be the "yellow water." Now, since there is a great diversity of opinion respecting the cause of the disease on these farms, many asserting that it is owing to the nature of the water, I wish you would give your opinion through the columns of your valuable journal respecting the causes of it, and state if it is infectious. What means would you recommend to pursue as a preventive, and how would you treat the disease on the appearance of the first symptoms of attack? A SUBSCRIBER.

Nottawa, March 9th, 1870.

REPLY.—The disease is produced, in all probability, from some obnoxious herb, or possibly impure water. We cannot think that the disease is infectious. "Yellow water" is such a vague term that it is impossible for us to form an opinion as to the nature of the malady. Perhaps fallowing, or green-cropping the land, and also dressing with lime, might improve the quality of the grasses, etc.

The Dairy.

Standard Butter and Cheese.

To the Editor.

Sir,—I send you the following extract from an English newspaper, and it would be well for our farmers to bear in mind that similar cases are not rare.

"FANCY BREAD AND NASTY BUTTER.—At the Sheffield Town Hall recently, a provision dealer named Charles Fielding, was summoned under a borough by-law, for being in possession of about 350 pounds of butter, which was in a nearly putrid state, the smell being worse than that of manure. The defendant, who does a very large business, did not deny that the butter was bad, but said that he generally sold it to confectioners, who made fancy bread, etc., with it. He denied that he retailed it in the shop, and said that he had for seventeen years sold it to confectioners at about nine pence per pound. It was Canadian butter, and he had sometimes about 200 firkins (nearly 17,000 pounds) of it on his premises. The Bench commented on the case, and ultimately ordered the butter to be destroyed, and inflicted a fine of twenty shillings, the extreme penalty under the by-law."

It is incredible that all the bad butter this dealer sold was Canadian; in fact he could not have obtained it for seventeen years; yet such a statement leads many to infer that Canada really sends an immense quantity of this sort of stuff to the British market.

What are the facts? Of late years a large quantity of butter has been exported, and this has been of quite a mixed quality and value. Some has been good butter put in bad packages, which have either spoiled its keeping, or imparted bad flavours; some has been bad at first, and although put in proper wood, its value could not be increased. Some has been injured by too large a proportion of salt. But the larger part of the bad butter has never been thoroughly or properly worked; such may be said never to arrive at its destination in a wholesome condition.

It is certain a large quantity of this kind of produce is passed off as coming from wrong localities, and Canada is often made the scape-goat for bad butter, cheese, etc., that never even crossed the Atlantic. Let our farmers unite, in different localities, and what they have to spare of these articles make well, handle and pack carefully, and mark with distinctive brands—raise the standard, and in a short time their produce would be in request at greatly advanced rates. R.

A case of hydrophobia in a cow is reported in the *Farmer* (Scottish) of February 2nd. During the past few months, it is stated, many cases of the kind have occurred in the same neighbourhood (Alcomden, near Hedden Bridge) among pigs, cows, and horses, as well as among dogs and cats, and several instances of the disease in the human subject are also reported.

Feeding Dairy Cows.

At some of the Dairymen's Conventions that have been recently held in various places this matter has been discussed by different parties, and all seem to be impressed with the idea, as brought out by the relation of several actual experiences, that in order to obtain the largest amount of actual profit from cows kept for the sake of their product, in the form of butter and cheese, it is necessary to give them some extra feeding in the summer beyond what they obtain from the pastures. One told of expending \$25 per head on his cows from March to November, over and above the value of their pasturage. During April and May he gave each cow a mixture composed of four quarts of corn and oatmeal, one quart oil meal, and eight quarts bran per day, in addition to hay. After they went to grass the meal and hay was left off, and twelve quarts of bran per day given. As soon as sowed corn was fit to cut for fodder, and the pastures began to dry up, he gave them cut fodder in addition. His cows gave an extra yield under this treatment of 200 pounds of cheese each over cows on pasture alone, and were besides quite fat at the end of the season, and so worth at least \$10 per head over what they would have brought if in ordinary condition. So that for an investment of \$25 each he realized \$35 each, or \$10 profit per head over what he would have had on pasture alone. Besides this, the extra feeding enabled him to keep forty cows on pasturage that without it could have kept but thirty-two, and this added to the profit made on the feed, gave him an extra profit of \$755 over and above what he would have had without using the extra feeding. This matter of extra feeding of cows when at grass ought to obtain place with our best dairymen, and the actual results of even soiling the cows with corn fodder while at grass, would, no doubt, show largely in favour of the practice.

It was resolved at a meeting in Derby, England, February 18, convened by the Derbyshire Agricultural Society, to establish three cheese factories in the county on the American principle.

At a meeting of the Little Falls Farmers' Club, Mr Willard said his observation led him to believe that it was better to have one large pasture than to alternate from one to another. The feed was more uniform and the result more satisfactory. It was thought that it would take in Herkimer county from one and a half to two acres of pasturage to keep one cow. In some very fine pasturage, an acre would suffice.

The cheese factory at the front of Sidney was built in 1866, and cost, including all apparatus, double sets of cans for each shareholder, and six spring wagons, the sum of \$6,318. In 1866 the cows numbered 250, which increased in 1869 to 750. In 1866 the gross receipts were \$9,950.04, and in 1869 they amounted to \$23,422.34. The total amount of all the expenses is about two cents per pound of cheese. All the trouble the stockholders have in connection with the matter is to deliver the milk at the cow stables, and draw a check for their money at the close of the season.

Poultry Yard.

Golden Pheasants.

It is a commonly prevailing opinion that the Golden Pheasant is not a hardy bird—a mistaken idea. When I resided in Woodstock, Ct., I tested that thoroughly. All that is needed for their protection in winter is to have some clumps of evergreens in the lawn, say eight or ten feet in diameter. Under such cover my pheasants have remained all winter, being in perfect health. Towards morning, you will hear the Golden Pheasant cock begin to crow lustily, with a sharp loud crow, as much as to say, "We are all well." The latter end of April or beginning of May the female bird begins to lay. She will select her nest in some easy place, and lay from 14 to 19 eggs. She ought not to be disturbed or frightened off her nest; if so, she will drop her eggs anywhere about the enclosure. When she began to sit, I used to take the eggs and put them under a small bantam. They are twenty-four days coming off. When hatched out, take them with the bantam mother and put them in a square box; four boards nailed together, about four feet long and twelve inches high, will answer; let them fit close to the ground. Give them no food for twenty-four hours, then give them hard boiled egg, with lettuce chopped fine, varying the food: sometimes a little curd, breadcrumbs wet with a little sweet milk. The more varied their food and the more frequently renewed, the better. At two or three months old, feed them on barley, oat grits, etc.

I have often thought—think so now—that a gentleman's lawn is not complete without these harmless pets. A neat wire fence, five feet high, is all that is required to keep them. Then they can have these beautiful birds in all their gorgeous colours.—*Cor. in Western Rural.*

Turkey Raising.

With many farmers, the raising of turkeys is a precarious business, owing to the tenderness of the young during the first month, or two months after they are hatched. Success in the management will depend much on the situation of a farm. A warm southern exposure for the farm buildings, and ample grounds for the young to exercise, without strolling too much in the wet grass, and warm places to retreat into in cold and wet stormy weather, are the chief requisites to succeed in raising a flock of turkeys. They will subsist on any of the different kinds of grain raised on the farm; it is only the manner of feeding which is important. They require to be fed little and often, and if the women folks will take an interest, there will seldom be a failure. Vermin should be carefully guarded against; by coming in contact with other poultry and having access to their houses, the young turkeys may become infested with

lice, which will be a great drawback to their growth, and perhaps cause a failure to raise a brood. For five years past I have discontinued keeping turkeys, finding them not very profitable when there were no conveniences to restrain them from committing depredations on the crops. But since I have no turkeys on the farm it has been sadly overrun with grasshoppers, and for two years past they have totally destroyed my turnip and ruta baga crops. I will try raising turkeys again, to see if it will rid me of the grasshoppers. Fifty turkeys roaming in the fields, in a week's time will destroy bushels of these pestiferous insects. If wild turkeys can be obtained and domesticated to cross with the common stock, it would improve the size and make them more robust to bear the rain and wet grass, and therefore more easily raised. By crossing the breed with wild turkeys, the progeny will be more of hunters of flies, bugs and other insects, and less inclined after grain, and of course more profitable. I saw in Millin County a domesticated wild turkey gobbler, a beautiful fowl, his colour brown and snuff, with plumage having a lustre and brilliancy almost equal to the peacock. The wild turkey gobblers do not come to maturity till they are about two years old; the one in question was a large noble bird, twelve months old, but had not commenced to gobble. Fifty of such gobblers as I raised years ago, to take to market the coming Christmas, would bring a handsome pile. I have had on my premises turkeys weighing as much as forty pounds. But turkey raising is attended with much trouble and care, and if not properly managed will be a losing concern, and were it not that I am so sadly harassed with grasshoppers, *any* turkey should gobble on my farm.—*Cor. Journal of the Farm.*

Poultry Association.

To the Editor.

Sir,—At the meeting of the Board of Agriculture, on the 24th February, Professor Buckland proposed a grant to the Ontario Poultry Association.

Mr. Rykert opposed the motion on the ground that a good deal of complaint had been made respecting the exclusive character of the Association.

I should be obliged if he would also state by whom the complaint was made. As one of the original promoters of the Society in 1866, I shall be fully borne out by its members in saying that in the first instance we called it the Canada West Poultry Association, and when the Province, on the formation of the Dominion, became Ontario, the word Ontario was substituted for "Canada West." This was done, in both cases, to obviate any such idea as that now started by Mr. Rykert.

The membership is open to all. The competition is not restricted to any part of the world; but why the citizens of Toronto, who have solely contributed in a most liberal

manner to the prize list and expenses of the four exhibitions that have been held, should do so for the amusement of other cities, it is difficult to understand.

I am safe in saying, I believe, that not one cent, exclusive of membership and entrance fees, has been gratuitously contributed towards the benefit of the Society outside of Toronto, except in one instance, when a distinguished exhibitor from Montreal returned his prize money as a donation to the Society. A circular was sent to individual members at the commencement of this year, asking for voluntary contributions towards the expense of a fifth exhibition. What was the result? Several prominent members from a distance requested their names to be erased from the Society's books; and to judge from the response received outside of Toronto, it would appear that if, as Mr. Rykert appears to wish, exhibitions are to be held at St. Catharines, Hamilton, and other cities, the \$100 proposed as a grant will have to be multiplied by six to enable the plan to be carried out.

Towards the expenses of a show in April next some few—three or four—not in Toronto, have proposed to give; but I believe this is the first instance of the kind on record. If Mr. Rykert will examine the list of awards at the four exhibitions I think it will be seen that most of the exhibitors were not from Toronto, and that most prizes were sent elsewhere.

The constitution and records, and the uniform practice of the Association, will clearly prove to any unprejudiced person that there is really not the slightest ground for this most unfair charge of exclusiveness. It is the country that we aim to benefit, and to the country at large, without favour, the membership is open, and the fact of the exhibitions being hitherto confined to one place has been a matter purely of economy—indeed, of absolute necessity, on the ground of expense.

F. C. HASSARD.

The Nova Scotia Dog, Pigeon, and Poultry Club propose to hold a show in Halifax in June next, provided the requisite funds can be obtained. T. D. Almon, M. D., is the Secretary.

CHANGE OF COLOUR.—Mr. Andrew Russell, of Pakenham, who has kept Black Spanish fowls for some years, was surprised to observe lately the plumage of one of his full-bred Spanish hens changing colour; she is now pure white.

INFLUENCE OF RAILROADS ON THE HATCHING OF EGGS.—A peculiar effect of the proximity of railroads on the hatching of eggs has been mentioned in various papers. It has been found that there are scarcely any chickens raised in poultry yards which are situated in the immediate neighbourhood of the rails of a much frequented railroad. This fact is supposed to result from the earthquake-like trembling shaking the soil caused by passing trains, which exert an unfavourable influence on the eggs.—*Et.*

Entomology.

Imported Insects and Native American Insects.

If we examine into the history of the imported Currant Worm and the native Currant Worm, we shall find a very curious state of things. These two insects both produce sawflies, which are so closely allied to each other, that although they are referred to distinct genera by entomologists, it may be doubted whether the genus (*Pristiphora*) under which the native species is classified be not a mere subgenus of that under which the imported species is classified. Reasoning *a priori*, therefore, we should expect to find a very great similarity in the destructive powers of these two worms, especially as each of them infests the leaves both of the red currant and of the gooseberry. But what are the actual facts? On the one hand we see a Native American species, which must have existed here from time immemorial, feeding on our wild gooseberries and perhaps on our wild red currant, and which yet has troubled our cultivated gooseberries and red currants so very slightly, that it cannot be proved with absolute certainty to have ever done so at all, except in Rock Island County, Illinois, and in Scott County, Iowa.

On the other hand we see a species, only introduced into this country from Europe some twelve years ago, which has already almost put a stop to the cultivation of the gooseberry and red currant throughout a large part of the State of New York, the northern borders of Pennsylvania, and the whole of Canada West, and is slowly but surely extending itself in all directions from the point where it was originally imported. What can be the reason of such a wide difference in the noxious powers of two such closely allied insects, feeding on exactly the same plants, but one of them indigenous to America and the other imported into America from Europe? Nor is this the only case of the kind. We can point out at least three other such cases. The imported Onion-fly (*Anthonia ceparum*), is a terrible pest to the onion grower in the east, though it has not made its way out west. On the other hand, the native American Onion fly (*Ortalis arcuata*, Walker), which is a closely allied species, and has almost exactly the same habits, has only been heard of in one or two circumscribed localities in the West, and even there does but comparatively little damage. Again, the imported Oyster shell Bark-louse (*Aspidiotus conchiformis*) is a far worse foe to the apple and certain other fruit trees than our indigenous Harris's Bark-louse (*Asp. Harrisii*) though each of them infests the same species. Finally, the imported Meal-worm Beetle (*Tenebrio molitor*) swarms throughout the whole United States, and is a great pest, while the native American species

(*Tenebrio obscurus*), which has almost exactly the same habits, belongs to the same genus and is of very nearly the same size, shape and colour. It is comparatively quite rare among us, and is scarcely known to our millers and flour-dealers.

On a careful and close examination, it will be found that almost all our worst insect foes have been imported among us from the other side of the Atlantic. The Hessian Fly was imported almost ninety years ago; the Wheat Midge about half as long ago; the Bee Moth at the beginning of the present century; the Codling Moth, the Cabbage Tinea, the Borer of the red currant, the Oyster-shell Bark-lice, the Grain Plant-lice, the Cabbage Plant-lice, the Currant Plant-lice, the Apple-tree Plant-lice, the Pear-tree Flea-lice, the Cheese Maggot, the common Meal-worm, the Grain Weevil, the House Fly, the Leaf-beetle of the Elm, the Cockroach, the Croton Bug, and the different Carpet, Clothes and Fur Moths, at periods which cannot be definitely fixed. Even within the last few years the Asparagus beetle has become naturalized in New York and New Jersey, whence it will, no doubt, spread gradually westward through the whole United States, while the Rape Butterfly was introduced about a dozen years ago, and is rapidly spreading over some of the Eastern States. And only a year ago the larva of a certain Owllet Moth (*Hypocymna dispar*), which is a great pest in Europe both to fruit trees and forest trees, was accidentally introduced by a Massachusetts entomologist into New England, where it is spreading with great rapidity. It is just the same thing with plants as with insects. We have looked carefully through Gray's *Manual of Botany*, and we find that—excluding from consideration all cryptograms, and all doubtful cases, and all cases where the same plant is supposed to be indigenous on both sides of the Atlantic—no less than two HUNDRED AND THIRTY-THREE distinct species of plants have been imported among us from the Old World, all of which have now run wild here, and many of which are the worst and most pernicious weeds that we have to contend against. In the *U. S. Agricultural Report* for 1865, pp. 510-519, will be found a list of 99 of the principal "Weeds of American Agriculture," by the late Dr. Wm. Darlington. Of this whole number no less than 43, or nearly one half, are species that have been introduced among us from the Old World. Among these we may enumerate here, as the best known and the most pernicious, Buttercups (two species), Shepherd's Purse, Saint John's Wort, Cow-cockle, Mayweed or Dog-fennel, Ox-eye Daisy, common Thistle, Canada Thistle, Burdock, Plaintain, Mullein, Toad Flax, Bindweed, Jamestown (Jimson) weed, Lamb's Quarter, Smartweed, Field Garlic, Foxtail Grass and the notorious Cheat or Chess. And to these we may add the common Purslane, which through some strange oversight has been omitted in Dr. Darlington's catalogue.

It will be supposed, perhaps, since there are

about as many voyages made from America to Europe as from Europe to America, that we have fully reciprocated to our transatlantic brethren the favours which they have conferred upon us in the way of noxious insects and noxious weeds. It is no such thing. There are but very few American insects that have become naturalized in Europe, and even these do not appear for the most part to do any serious damage there. For example, on one or two occasions, single specimens of our Army Worm Moth (*Zeugma unipuncta*) have been captured in England, but the insect has never spread and become ruinously common there, as it continually in particular seasons does in America. Our destructive Pea Bug (*Bruchus pisi*) has also found its way to Europe, but although it is met with in England, and according to Curtis has become naturalized in the warmer departments of France, Kirby and Spence expressly state that it does not occur in England "to any very injurious extent," and Kirby seems to doubt the fact of its being naturalized in England at all. Again, the only species of white ant that exists within the limits of the United States (*Termes frontalis*) has been known for a long time to be a guest at the Plant-houses of Schonbrunn in Germany, but it is not recorded to have ever as yet spread into the surrounding country. As to our American Meal-worm (*Tenebrio obscurus*), Curtis states that it has been introduced into England along with American flour, and that it is sometimes abundant in London and the provinces; but Kirby and Spence say not one word about it, and it seems to be confined to the English seaports and the places where American flour is stored, without spreading into the adjacent districts.

A very minute yellow ant, however (*Myrmica molesta*), which is often very troublesome with us in houses, has, according to Frederick Smith, "become generally distributed and naturalized" in houses in England; and Kirby and Spence state more specifically that "it has become a great pest in many houses in Brighton, London and Liverpool, in some cases to so great an extent as to cause the occupants to leave them." As to our Chinch Bug, our Curculio, our Plum Gouger, our two principal Apple Tree Borers, our Canker Worm, our Apple-tree Tent Caterpillar, our Fall Web Worm, our Peach-tree Borer, and our other indigenous pests among the great army of Bad Bugs, nobody ever yet found a single one of them alive and kicking on the other side of the Atlantic. And with regard to plants, the only two American plants that we know to have become so firmly established in Europe as to be a nuisance there, are an American aquatic plant, the common Water Weed (*Amcharsis canadensis*), which has choked up many of the canals in England; and our common Horse Weed, (*Erigeon Canadens*) which has spread from America nearly over the whole world.—*American Entomologist*.

The Pea Weevil.

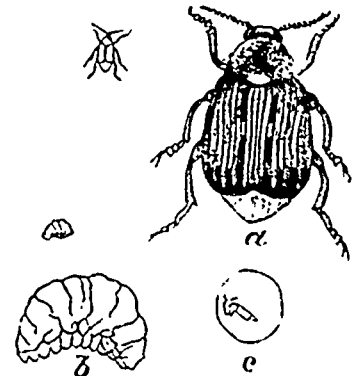
To the Editor.

Sir,—Mr. Wm. Langdon, of Brighton township, handed me the enclosed peas, with the request that I would send them to you, as each pea contains what has been thought a curiosity by all to whom they have been shown.

As we are readers of your journal, if you will give in it a description of the insect that is enclosed in each pea, telling its name, when and how it got into the pea, as the insect is perfectly developed in the pea, and yet the skin of the pea is not broken, you will oblige. Is the specimen sent the pea bug, that makes the raising of peas in the State of New York, and some other places, almost a total failure? By giving the information sought in your journal you will answer at once a great many enquiries and oblige many of your readers in this section.

Castleton.

DARIUS CROULER.



a. perfect beetle, b. larva—both greatly magnified, the accompanying outlines representing the natural size; c. infested pea.

NOTE BY ED.—The peas sent us by our correspondent contain specimens of the Pea Weevil (*Bruchus pisi*). On each pea may be observed a slightly discoloured round spot, which is found on inspection to be caused by a hole in the pea, under the thin hull, containing a small blackish beetle. It certainly at first sight appears strange how the perfectly developed beetle can have got into the pea when the skin is entirely unbroken, but a little insight into the history of the creature explains the seeming mystery. When the peas are in blossom, the parent beetle lays its eggs in the tender pod. From these hatch out tiny little worms, which perforate and enter into the soft newly-developed peas, making a very minute hole, which speedily closes up with the growth of the pea. The worm grows as the pea increases, eating away at the mealy part of it and usually sparing the germ, till at length it assumes the pupa state, and finally, when the pea ripens, completes its transformation into a perfect beetle. Here it remains, with only the thin epidermis between it and the outer air and liberty, all winter, till the warmth of spring bids it eat through the husk and perform its proper avocations.

It is not long since we gave a brief account

of this creature, in acknowledgment of a number of specimens sent us from Quebec. It is needless, therefore, for us to enlarge further upon its history.

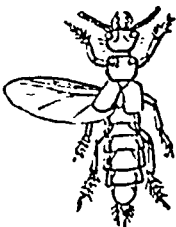
The following remedies may be mentioned:— Keep the infested peas in tight vessels over one season; that is to say, instead of sowing the produce of last year's crop this spring, keep them till next year. The weevils will soon come out with the increasing warmth, and finding no escape, will die in the vessel before the end of the year, and thus the peas will be free from their attack. Another mode is to dip the peas in boiling water just long enough to kill the beetles, but not destroy the germ. One minute is sufficient.

Scavenger Beetles

In our last article upon insects that are beneficial to mankind, or that are at least of so harmless a character that they should be spared from the universal sentence of death too often passed upon the race, we gave an account of the families whose agreeable occupation it is to act as sextons for the smaller animals, or otherwise dispose of carrion. The next tribes of beetles that come within our present range of observation, discharge a somewhat similar office in the domain of nature, and busy themselves in the removal of nuisances from the surface of the earth.

To quote the words of Kirby and Spence (*Introduction*, Letter ix.),—"How disgusting to the eye, how offensive to the smell, would be the whole face of nature, were the vast quantity of excrement daily falling to the earth from the various animals which inhabit it, suffered to remain until gradually dissolved by the rain, or decomposed by the elements! That it does not thus offend us, we are indebted to an inconceivable host of insects which attack it the moment it falls; some immediately begin to devour it, others depositing in it eggs from which are soon hatched larvæ that concur in the same office with tenfold voracity; and thus every particle of dung, at least of the most offensive kinds, speedily swarms with inhabitants which consume all the liquid and noisome particles, leaving nothing but the undigested remains, that soon dry, and are scattered by the winds, while the grass upon which it rested, no longer smothered by an impenetrable mass, springs up with increased vigour." The insects that engage in this work belong to many different tribes, chiefly pertaining to the orders of Beetles and Flies (*Diptera*). A large proportion of the former come in natural sequence almost immediately after the Carrion Beetles already described, and may, therefore, be fully reviewed here. To give a complete account of all the different families of beetles that belong to the hordes of scavengers, would be a long, and—to the general reader—by no means an interesting proceeding; we shall, therefore, content ourselves with describing the peculiarities in structure and habits of the common sort.

The first, and most numerous family, that we come to, includes all those species of beetles called in England Rove-beetles, or Cock-tails (*Staphylinidæ*). They are readily distinguished from all the other families by their peculiarly long and narrow bodies, flattened form, and very short wing covers, which only cover one or two segments of the abdomen, instead of almost the whole of it, as is the



general rule with beetles. These short wing-covers give the insect somewhat the appearance of wearing a boy's short jacket, instead of a long coat; notwithstanding their brevity, however, they completely conceal and keep out of the way the ample membranous wings, which, when not in use for flight, are beautifully tucked away beneath them. The long uncovered abdomen is capable of being moved in different directions, and is employed by the creature in folding and unfolding its wings. When irritated or alarmed it cocks its tail over its back, and assumes a ludicrously threatening aspect; it also possesses the power, probably for defence, of protruding at will two vesicles from the extremity of the abdomen, which emit a very unpleasant, and sometimes indescribably fetid odour.

The chief food of these insects, both in the larval and perfect states, consists of decaying animal and vegetable matters; in early summer every piece of dung that falls to the earth speedily swarms with them, and in the autumn they are equally numerous in fungi, agarics, etc. Some species are also carnivorous, feeding upon other insects; in England a large species, commonly called the Devil's Coach Horse (*Guerius olens*) devours large numbers of the destructive ear-wig (*Forficula*); "On the least approach of danger," Westwood relates, "this insect, like the rest of the group, immediately puts itself into a most ferocious-looking posture of defence, throwing the tail over the head like a scorpion, protruding the anal vesicles, elevating its head and widely opening its long and powerful jaws."

Upwards of four hundred species of this family of beetles are found in North America, and of these, one hundred and five species have been taken in Canada. Many more undoubtedly remain to be found and described when collectors pay more attention to the minuter forms of insect life. Eight hundred species have been described as found in England alone. In tropical climates they are very rare; their places as insect-scavengers being supplied by the excessively abundant ants and termites.

Look Out for the Colorado Potato Beetle!

The potato growers in the extreme western part of Canada must not be surprised if they find a new and most destructive insect appear-

ing upon their plants this year. The hosts of the terrible Colorado Potato Beetle (*Doryphora 10-lineata*, Say) are steadily marching on in their journey from the Rocky Mountains to the Atlantic Ocean; they have already made their way into the neighbouring State of Michigan, and either this summer or next we may expect to hear of their invading our shores along the River St. Clair. Should this insect obtain a footing in our country, we can assure our readers in all earnestness that they will find it a far more grievous nuisance than any horde of Fenians with which we have ever yet been threatened, or are likely to be troubled with; the ravages of this small foe would undoubtedly prove a far greater source of pecuniary loss and inconvenience to the whole country than any raid of these barbarous ruffians. To be "forewarned" is, to a great extent, to be "forearmed;" let us then be on the look-out for these creatures, and be prepared to repel their attacks whenever they begin to advance upon our land. Kill every one that comes, and show them no mercy, is our advice to our readers; do not wait till they get a foothold in the country, but destroy them immediately upon their arrival; and let those who live along the St. Clair keep a good look-out for their appearance.

The history of this insect is rather a curious one. For many years it was known to feed upon a wild species of potato, peculiar to the Rocky Mountain region; but when civilization, and the consequent culture of the tuber, advanced so far westward, it soon acquired a taste for the cultivated varieties, until in 1859, by advancing eastward from one potato patch to another, it reached a point one hundred miles west of Omaha, in Nebraska. In 1861 it began to appear in Iowa; in 1864 and '65 it crossed the Mississippi River, and invaded the State of Illinois. At that time the late Mr. Walsh predicted (*Practical Entomologist*, vol. i) that it would in all probability "travel onwards to the Atlantic, establishing a permanent colony wherever it goes, and pushing eastward at the rate of about fifty miles a year." This prediction has, so far, been fulfilled in a remarkable manner; in 1866 it invaded southern Illinois; in 1867 it passed into Western Indiana and the south-west corner of Michigan; in 1868 it had reached Ohio, and the south shore of Lake Superior in the north-western corner of Michigan; last year it went over a great portion of that State, and therefore this year we may expect it in Canada.

This insect when seen in a cabinet is a very beautiful creature; its body is cream-colored, its wings of a bright rose color, and its wing-covers are adorned with five deep black stripes. Farmers and gardeners, however, whose potato crops are blasted by it, do not usually discern its beauties, but consign it to speedy and unhesitating destruction. It feeds upon the plants in both its larval and perfect states, driving everything before it. Should any of our readers have the ill-fortune to find it in their fields this year, we beg that they will send us some specimens, in order that we may give a further and illustrated description of them.

Potato Beetle.

To the Editor.

SIR,—In an article on the Colorado Potato Beetle you give an interesting history of that destructive insect, and caution gardeners and farmers, (and I am a little of both) to be on the lookout this year for this new pest, an enemy to the potatoes. I live four miles to the east of Guelph, close to the Grand Trunk Railway, and, if I mistake not, the beetle you describe at the end of your article was here last July in hundreds on my potatoes; on a hot day somewhere about that time, I was hoeing my Early Goodrich Potatoes, and saw a few strangers, to me, of the beetle tribe on the leaves of the potatoes which were very rank; and just at the time they were coming into bloom I was at work amongst them again, and that was on a hot day too, (I try to kill weeds on such days), these gay beetles were pretty numerous, both on the potatoes and flying about, and I was particularly struck, both by their beauty and their numbers, and thought at the time that they meant no good.

I have nothing to guide me, but the enclosed sketch is, according to the best of my recollection, something about his size, and it track me when they were on the green leaf, that they were black and white, and when on the wing, pink looking; and, unlike some other beetles, they are easily killed by the finger and thumb, for I did kill a good many in pairs, male and female; but I did not observe that they injured my crop, and I saw none afterwards.

L.
Eramosa, Ont.

NOTE BY ED.—The specimens observed by our correspondent on his potatoes, judging from his description and sketch, belonged to the species called the "Three-lined Potato-beetle" (*Lema trilineata*, Oliv.).



The annexed wood-cut represents the insect a good deal magnified. This is a very common species in Canada, and occasionally becomes rather destructive. The Colorado Beetle is much broader and rounder in form, as well as a good deal larger, and may be recognized by its ten dark stripes on the wing-covers, five on each, whereas, our insect has only three black stripes, one down the middle, and one on each side. The Colorado Beetle could hardly have travelled as far east as Guelph without having been observed by some of our entomologists.

Live Beetles.

"A young beginner," residing in the township of Waterloo, has sent us some lively specimens of beetles that we should hardly have expected him to meet with at this time of year. The sight of them immensely delighted our entomological eyes, that have gazed upon few living specimens of insects for some months past, the more especially as everything about us is just now covered with

a couple of feet of snow, and the prospect of a "beetle hunt" is obscured by the haze of the apparently far distant future.

The specimens belong to three distinct species. (1). A long, slender Capricorn beetle (*Toxotus decoloratus*, Harris), about an inch in length, and with antennae but little shorter than the body, of a pale drab colour, with shining reddish head, thorax, legs, and antennae. This rare beetle our correspondent found in a "damaged birch tree," the wood of which, no doubt, served its larva for food. It belongs to a family whose numerous members are all wood-borers, but we believe that no one has hitherto discovered what particular tree this species attacks.

(2). A shining, deep chestnut-brown beetle, about half an inch long, belonging to the same family, and much resembling the only too common Meal-worm (*Tenebrio molitor*, Linn.). It is a species of *Uloa*, the members of which feed upon decayed wood, and also upon wheat, flour, etc. The specimen sent us, our correspondent found "in a decayed beech tree."

(3). Two specimens, male and female, of a small species of Stag-beetle (*Ceruchus piceus*, Weber). These insects are about half an inch in length, of a pitchy-black colour; the male is remarkable for his highly developed jaws, which are longer than his head, and furnished with two large teeth apiece, giving him a very formidable appearance. Some species of this family are of very large size, and furnished, in the males, with enormous toothed antlers of a stag, whence their common English name. Most of the species, including the one before us, feed upon the juices of decaying wood, and cannot be considered injurious. The large Stag-beetle of Europe (*Lucanus*) causes, however, much damage to the Willow and Oak, boring into the solid wood and also into the roots of the tree.

We must commend our correspondent's careful packing of these specimens: the little box, scooped out of a block of wood, in which they were enclosed, would defy the "stamping" of even the most energetic postmaster. We must also congratulate him upon his success in obtaining such good and rare specimens for a beginning; we hope that he will continue the pursuit, which he will find attended with much unalloyed pleasure.

A CHEAP GRUBKILLER.—Dissolve a coffee-cup full of salt in hot water, then put into a common sized watering pan and fill up with cold water. Just give each plant a gentle switch over with this mixture, and they will disappear in a moment, and the salt and water will nourish the plants wonderfully. All greens are fond of salt and water. Some people would be afraid of killing their cauliflowers; but it must be borne in mind that the salt and water will not penetrate the leaves. It runs off to the roots, killing every caterpillar in its way.—*Gardener's Magazine*.

Correspondence.

Which Kind of Barley Shall We Sow?

To the Editor.

SIR,—It appears to be of rather unusual importance, just now, to arrive at correct conclusions in reference to the above question. I believe that in attempting to do so it is necessary to consider the merits of two kinds only of barley—the six-rowed and the two-rowed—the four-rowed being little known in Canada and the States.

The six-rowed is by far more largely cultivated in both countries than the two-rowed, but the two-rowed is the favourite with the malsters and brewers in Great Britain, and is, in the experience of many farmers here, the more profitable crop, and, unquestionably is the finer, plumper, heavier grain. If, therefore, our choice is to be governed by the intrinsic comparative merits of the two varieties, there can be no difficulty in deciding upon the two-rowed. One thing is certain, it is becoming an absolute necessity to decide upon one or other of them for general adoption; for, as in the process of malting there is a difference of several days in the period at which the two varieties sprout, and as the merchants are unwilling or unable to provide separate accommodation for each sort, it follows that the two kinds are huddled together into one general receptacle, and that the malting process becomes one of confusion, embarrassment and loss.

The merchants appear to agree in the opinion that the two-rowed is the superior grain, and that the desirable thing is to get it generally adopted, but they are becoming urgent for the universal adoption of one of them.

The present mercantile view of the question is thus put by the *Albany Journal*.—"Six-rowed has been the favourite with malsters here this season. In this connection we would state that farmers would find it to their benefit, in their selection of seed this spring, to buy six-rowed Canada West. Six-rowed must supersede two-rowed, for even this season it has commanded twenty-five cents more than the two-rowed."

Now, this writer may be correct enough about the present commercial values of the two kinds of barley, but I very much question if he knows anything about the grain beyond its present relations to the market, which may soon be reversed.

Shall we, then, unite with the increasing numbers of those who are anxious to promote the adoption of the beautiful two-rowed barley, or shall we at once yield to the present (perhaps only momentary) mercantile view of the case, and sow six-rowed?

DANIEL D. SLADE.

Oshawa, March 9, 1870.

BARN.—We will attend as soon as possible, though we cannot do so at once, to our correspondent's request, and give a plan shortly.

"Name! Name!"*To the Editor.*

SIR,—Will you allow me the use of your columns to give a few homely words of advice to my brother farmers. I would say to them, one and all: Unfurl your bunting; spread your banner; exhibit your sign, and let the rest of the world know where you live.

I am led to take up this matter from seeing in your columns so many fictitious names to really good articles, written by those who have evidently practical experience of the subjects on which they write. Now, the withholding the name deprives the reader of a considerable part of the advantage and worth of the article. For instance, a writer some time ago gave an account of his experience with a variety of potatoes, some of which I had never tried, and I should have been glad to have applied to him for seed had I known his address. The man who writes a good article, and signs no name or a fictitious one, resembles him condemned in Scripture who 'puts his candle under a bushel.'

By all means let us have these communications from practical men and veritable farmers, but let each writer sign his own name, and give his post office address. I would further advise every one to mark everything that belongs to him—his waggon, sleighs, carts, bags, &c., and above all the rest, his gate or gate posts, as a guide to those who wish to see him. This custom would save many a vexatious, fruitless journey, and would maybe bring the farmer a welcome caller or customer, that would have been lost to him without the precaution. The name on the waggon or carriage would be a capital advertisement, the value of which all men of business know well and do not forget to take advantage of, and those who wished to see the proprietor would hunt him up. Try it, farmers. A. B. BROWNSON.

Bayfield, Ontario.

NOTE BY ED.—We always like, and indeed require, the names of correspondents, as evidence of good faith; but it is optional with the writer to have it published. No doubt, to the reader there are advantages in giving the name, and the article will often in consequence be perused with greater interest, and have greater weight. But there is one abuse of the practice against which we must take occasion to protest, and that is, making use of our literary columns for gratuitous advertisements. When a person has anything he wishes to bring before the public for sale, let it be agricultural produce, implements, or merchandise of any kind, it is not fair to expect a gratuitous insertion of a letter or article containing the information, and the vendor's name and address, along with the ordinary reading matter of the journal. The place for such communications is the advertising columns, and the price for their insertion the ordinary advertising rates.

Weather. Hay and Grain in Hastings.*To the Editor.*

SIR.—We are, at this date, literally snow-bound—a universe of sky and snow. Fences invisible; windows almost hidden; trees covered as high as their branches. Still, we will not complain, this is a blessing in disguise, a mantle thrown over the bosom of mother earth, cherishing her offspring. Underneath this veil are the fair features of youth and promise.

The crop of clover sown in this vicinity is nearly all threshed and marketed. The yield here is light, the seed inferior compared with other seasons. The wet season promoted the growth of stalk, leaf, and blossom, at the expense of the seed. In clays and calcareous soils the yield was better. It is proving a remunerative crop, though some contend that it, in the seed growing, exhausts the soil. A very wet season favours the advantage to be derived from plaster, owing, no doubt, to the attraction of that absorbent for moisture.

There is an abundance of hay in the country, it is difficult to find market for it. I think it would pay to press and bale it for some foreign market, or to be held over for a year of scarcity, or better, convert it into beef and mutton. There seems to be great need of a change in the varieties of grain grown here. There is not as good a yield of spring wheat as there should be, especially "Fife." While there is a mania for new and extraordinary potatoes and oats, we hear very little of spring wheat.

J. M. LE BOUTILLIER.

Sidney, March 17th, 1870.

Capacity of a Root Cellar.

C. R. wishes to know what space he must provide in building a root cellar for storing turnips, or how much to allow for a bushel of the roots.

It will be sufficiently accurate for this purpose if he calculates one cubic foot and two-thirds ($1\frac{2}{3}$) for each bushel, or $16\frac{2}{3}$ feet (in decimals about 16.66) for every ten bushels. An easy way of reckoning is to use the rule for measuring corn in the ear, which is as follows: Measure the length, width, and depth of the crib in feet; multiply these three dimensions together, and the product by 4; cut off the last right-hand figure; those to the left express the number of bushels of corn if the ears were shelled. Add one-half this amount, and you will have about the quantity of bushels of turnips in the same space. For example, suppose a space of 10 ft. x 20 ft. x 8 ft = 1,600 ft. Multiply by 4 = 6,400. Cut off the right-hand figure, leaving 640—the number of bushels of shelled corn. Add half this. 640 and 320 make 960, which would be about the number of bushels of turnips to allow for the same space.

Plaster of Paris.

A subscriber asks, "what benefit is Plaster of Paris to clay land, or land that overlies a bed of plaster? how used, in raw pulverized state, or burnt? and in what manner is it applied to the land? what effect on light and sandy soils?"

ANS BY ED.—In the CANADA FARMER of Feb. 7th, 1869, will be found an editorial on this subject, from which it will be seen that the chief value of plaster is as a stimulative manure to clover. It is the sulphuric acid contained in plaster that renders it valuable for clover.

It makes little difference as to the soil on which it is applied, provided the object is to benefit the clover crop. Its manurial value no clay lands would not be equal to that of lime, except for clover alone; nor does it, as a general rule, pay to use it as a manure for any other crop than clover, except perhaps when it is applied to the young plants of Indian corn, which is commonly done at the rate of a handful to each hill.

It is always burnt before being ground, and is applied by scattering broadcast over the land, by hand, in much the same way as sowing grain, the usual allowance being from 100 to 200 pounds per acre, according as the clover is thick or otherwise; the thicker and heavier the ground is covered with clover, the more plaster is needed.

Broom Corn.*To the Editor.*

SIR.—In a recent issue of your journal, John W. Smoak asks if broom corn can be grown successfully in the vicinity of Hamilton. It may be interesting to him and others to learn that I grew it here in Ramsay, of good quality, fifteen years ago, and found that it would ripen in an ordinary summer before the fall frosts could hurt it, so I should conclude that it would do still better in the vicinity of Hamilton, which is some hundreds of miles nearer the equatorial belt.

WM. PATERSON.

Ramsay, Ont.

Clearing Land by Steam.*To the Editor.*

SIR.—Some of your readers interested in effective farm machinery will no doubt be gratified to learn that an experiment in drawing stumps by ordinary steam ploughing engines, just tried in England, has met with complete success, and in consequence some hundreds of acres of waste land will be brought into use. These were a few years since covered with Scotch firs, 12 to 20 inches in diameter. Attempts to clear the land of the stumps had failed, from the expenses incurred. An agricultural engineer being applied to, however, contracted to clear and plough the land, set to work two of Fowler's 14 horse power winding engines,

and the stumps were easily extracted at the rate of one per minute, two smaller engines being employed to draw away the roots into heaps. A six-furrow plough stood ready to turn over the land as soon as a sufficiently level surface had been made, which would readily be done by the steam cultivator or harrow.

Will not some of our capitalists, or even Government, try the same here? Would it not pay, and pay well? Might not a few acres thus cleared on wild lands render the lots more saleable, and divert hither some of the emigration now tending to the States?
K.

SUGAR BEET.—Mr. C. Loyd is referred to the article on this subject in the March number of the CANADA FARMER.

CHINESE YAMS.—Several correspondents have written to enquire where they can procure tubers of this esculent for seed. They can now be had of Prince & Co., Flushing, N. Y., for \$3 00 per hundred.

CHEMICALS.—"Nemo," writing from Quebec, wishes to know if there is a market in Canada for certain chemicals produced "from wood boiling," and what are the respective prices. We are informed by the leading wholesale druggists that there is here very little demand for them, and that the following are the prices: Sugar of lead, 15 cents per pound; acetic acid, 12 to 14 cents; acetate of lime, 6 cents; naphtha, 12 cents; charcoal, 12 to 14 cents per bushel in lump, 20 cents crushed.

DRAINAGE ACT.—A correspondent wishes us to publish the Ontario Drainage Act; but as the details of the statute have already been given in the GLOBE, and as copies of the Act have been sent to the Reeves of townships, and other officials throughout the Province, so that any one may have an opportunity of reading it for himself, it seems undesirable to republish the whole in these columns. But we shall be happy to answer, to the best of our ability, any questions in reference to special points about which correspondents may desire information.

WIND POWER FOR FARM USE.—A correspondent wishes information concerning a description of windmill adapted for farmers' use in sawing wood, cutting fodder, etc., etc. There are many such mills manufactured in the United States, and they are extensively used on the prairies, where the wind has great sway, and consequent power. It may be doubted whether such will answer here in Canada, except in very exposed situations. Farmers are usually so situated near woods that the wind passes high above them, and a very tall mill would be required to be of any use. There are, however, localities where such mills may be used to advantage, and our correspondent is recommended to apply to any of the windmill makers, who usually advertise in American papers, before attempting a home-made contrivance, which, from want of experience, may fail.

CANADIAN HERD BOOK.—A correspondent enquires whether a second volume of the Canadian Shorthorn Herd Book will be published shortly. We understand that early next year, or sooner should a sufficient number of entries be made, the second volume will make its appearance.

CRUSHING BONES FOR MANURE.—One of our correspondents wishes to know the best way to crush bones on a small scale. The usual course adopted is to erect strong fluted rollers, so constructed that a succession of points come in contact with the bones, thereby exposing them to an immense pressure as the roller rotates. After being once crushed thus coarsely, the bones are passed through a finer set of rollers with smaller teeth or points mashing into each other; and when thus crushed into about half-inch size, the dust is sifted out, and the uncrushed portions passed through stones and ground like gypsum or plaster. Bones, to be at all efficient as manure the first or second year, must be ground very fine, the finer the better. Half-inch bones will remain many months in the earth without decomposition, and consequently the farmer using them often feels much disappointed in the utility he expected he should have derived from their use. Bones of half inch size are better adapted for those situations and uses in which advantage is sought from a very gradual decay, such as vine borders or the like. The process sometimes adopted, of pounding the bones, is altogether less efficient than the crushing action of properly constructed rollers.

The Canada Farmer.

TORONTO, CANADA, APRIL 15, 1870.

The Provincial Association.

At the last meeting of the Council of the Agricultural and Arts Association an animated discussion and somewhat warm expression of feeling were elicited by a communication from the Minister of Agriculture, reflecting on the expensive management of the Association, and proposing certain measures with the view of reducing this expenditure, suggesting, among other things, that the present Agricultural Hall should be sold, and the library and offices removed to the Parliament Buildings. This proposition, though ostensibly one of economy, was regarded as, in reality, the first step in a scheme to bring the Association and the Council under the more direct control of the Bureau of Agriculture, and as such was emphatically and almost unanimously protested against, though the further discussion and final decision of the Council on the matter were postponed to the next meeting.

We sincerely trust that the complete independence of the Association will be carefully preserved. Whatever errors there may have been in the past management of the funds or general business, the fault must rest with the farmers throughout the country if in future the management is not what it should be. They have the matter now in their own hands, and have only to elect to the Council competent men who will faithfully discharge their duties, to secure the just and efficient administration of its affairs. Whereas, if the control of such a valuable public institution should pass into the hands of Government, the probability is, let who will be in power, that its interests will suffer. The Minister of Agriculture for the time being will have received his appointment from political and party considerations, and will in all likelihood be totally ignorant of agriculture, and the wants of that large class of the people who are engaged in agricultural pursuits. Or should he, by any singular good fortune, be a fit man for the position, his tenure of office may at any time expire, and his good intentions prove abortive. The men whom the farmers, through the agricultural societies, elect to the Council of the Association will, on the other hand, be the elite of their own class, every way well qualified to represent their views and advance their interests. The well-being of the Provincial Association must assuredly be safer in such responsible hands than in those of the Government Bureau. This is the feeling, no doubt, of the agriculturists generally; they have confidence in the present members of the Council, and if that confidence should be misplaced, the elective constitution of the Board and limited tenure of office leave the remedy where it should be, in the power of the farmers themselves.

The Farmers and the Protectionists.

One of the shrewdest acts of the would-be "Canadian monopolists" has been their cunning device to draw the farmers into their net. Though the Protectionist orators of Toronto, while addressing a city audience, could only style men engaging in agricultural pursuits as "hewers of wood and drawers of water" as compared with those in the higher walks of life pursued by the operators in factories, still, before the farmer, they have another story to tell, and strive to gain his consent to their schemes by promising him Protection in the shape of a duty on foreign breadstuffs. Now, did it ever occur to the farmer how

much such protection would amount to, and what he would gain by it! Look at it even from the standpoint of the rankest Protectionist. Take flour for example. Against some \$2,069,274 worth which we have imported from the United States, we have exported to the United States about \$10,000,000 worth. Shut out \$2,000,000 worth, and we still export to the value of \$8,000,000 more than we consume. Now, if we did not produce enough flour for our own consumption, there would be a possibility of advancing the price of what we have by putting a protective duty on foreign produce; but so long as we export \$8,000,000 worth it is the world's market and not that of the Dominion that must fix our prices. In other words, the Dominion not being able to control the world's market, the world will control the Dominion's. In the meantime, however, the duty on breadstuffs will have answered the purpose of the Protectionists in opening the door for class legislation, and schemers of all classes will be clamouring for Protection. Coal will be protected, cotton will be protected, woollen goods will be protected, this thing will be protected, and that thing will be protected, till the unfortunate farmer who holds the key—the balance of power—and who, in hope of gain opened the door, will find that himself and his interests have been completely trampled under foot and forgotten by the eager throng who are rushing in through it. His cost of living will be doubled or trebled. Every yard of cloth he uses, every farming implement he needs, every pound of nails he buys, in short everything he consumes, save that which he has to sell, will cost him twice or thrice as much as it formerly did. He will no longer be able to go into the markets of the world to supply his wants, but he must pay just what the monopolists of his own country choose to ask. Where is his refuge? He is "protected," not a bushel of grain can come into Canada without paying a heavy duty; but what does this avail him, when Canada cannot use all his grain, and he has to sell in markets where he is not allowed to buy, and where no protection can reach. His position is simply this. He is compelled to buy all his manufactures at inflated prices, while he has to sell at natural figures. It is as though we had a currency some twenty or thirty per cent. below par, in which the farmer must receive his pay for his produce, while he is compelled to pay gold for everything he has to buy for home consumption. Our inflation of prices for everything manufactured in the Do-

minion having cut down the purchasing power of gold, the farmer who would be compelled to purchase within the Dominion and sell outside of it would not need to be very acute to see that he was being grossly swindled by the workings of Protection.

Agriculture is, to use a common-place expression, the backbone of a new country like ours; it is the occupation of the masses, and to attempt to regulate its produce to the consumption of the people, would be as impossible as to regulate the supply of light and air. With manufactures, however, the case is different. Give a ring of manufacturing monopolists Protection, and they can wring from a country its last surplus dollar, without adding in the smallest degree to the welfare of any but themselves. The farmer with his outflowing produce brings in the gold of foreign countries, while the greedy monopolist, who dare not take his chance with the farmer in the world's market, stays at home, and parasite-like, grows fat off the industry and thrift of those "hewers of wood and drawers of water."

The Duty on Live Stock

A memorial has been presented to the House of Commons from the Provincial Board of Agriculture, asking the Government to allow the importation of live stock designed to improve the breeds in the country; and Mr. Young, of Galt, moved a resolution to admit thoroughbred animals free of duty. The Finance Minister, however, declined to allow the resolution to be put, and, strangely enough, it was not pressed to a vote, although had it been, it would doubtless have been carried, or, if not, the farmers of the country would at least know which among the politicians were friendly towards giving even that very small concession to the needs of agriculture.

While our legislators have turned the cold shoulder to this very moderate demand, the Americans evince a different spirit, for a member introduced a resolution into Congress not long since, to allow of the free admission of all animals imported with a view to the improvement of the stock of the country, and it passed without opposition, and the matter was at once ordered to be taken up by the committee of ways and means. We do not know what ever induced our Government to place a duty on live stock at all, for while it has acted as a great drawback to prevent many from importing, by reason of the risk of forfeiture through some careless oversight or mismanage-

ment on the part of Customs officials, who are generally the most supercilious and obstructive of any class of men, the revenue derived has been ridiculously small, the importation being as follows in 1868:

Horses, 26; duty collected, \$390. Cattle, 2; duty \$20. Sheep, 54; duty \$54. Swine, 7; duty \$14.

Contrast this with our exports of live stock for the same year, which foot up as follows:—

Horses, 7,005; cattle, 40,660; sheep, 97,406; swine, 10,710.

The tax on the importer of improved stock is the more unjustifiable if it be true, as we are informed, that numbers of hogs are imported free ("in bond" it is called) by pork packers, to be re-shipped as pork to Europe and the Maritime Provinces. Surely the enterprising farmer has a better right to this slight indemnity than the mere trader.

Note.—In the tariff published since the above was written, we are glad to find an exemption introduced in favor of animals imported for breeding purposes.

The Drainage Act.

The Commissioner of Public Works has issued certain circulars and forms, together with a copy of the Ontario Drainage Act of last session, with a view of obtaining information as to those sections of the country which may be benefitted by the provisions of the Act. A copy of these documents has been sent to the various Reeves of the Provinces, with a request that the forms may be filled up and returned to the office of the Department. Amongst the circulars issued is one requesting the Reeves to inform the Commissioner whether there be any flooded, wet or moist lands in the township over which each presides. A form is enclosed which, being filled up, shows the No. of the lot, the No. of the concession, the approximate number of acres, and the quality of the land that the Reeve deems to be within the meaning of the Act.

Another circular calls attention to the Act, a copy of which is therewith enclosed, as well as to the "Act respecting Public Works" of 1869, and directs that the Council of the Township should, in the event of an allotment of money being made for drainage in their Township, agree to provide by By-Law for the repayment of the outlay as contemplated by the Drainage Act. A form of note undertaking to pass this By-Law is sent with the circular, which has to be signed by the Reeve—in Council, we presume—and returned to the Department. It is intimated in the circular that "the report and estimate for draining the lands can be obtained, when prepared, on application to the Department."

Notes on the Weather.

The past month of March has been one of exceptional character. The weather has been exceedingly cold and stormy, and the fall of snow has been, quite unexpectedly, great.

The mean temperature of the month has been 25°.8, which is 3°.8 colder than the average, yet 2°.7 warmer than March, 1869. The highest temperature was 44° on the 29th, the lowest, 5°.2 on the 3rd. There have been 4 clear days, 9 partially clear, and 13 overcast. The prevailing winds have been N. W., but there were 14 days on which the wind was from an easterly quarter. Very little rain has fallen, but the fall of snow has been 62.4 inches, being 52.1 above the average, and 47.4 more than March, 1869. The fall of snow the present winter has been 123.4 inches, or over ten feet, and this is ten inches in excess of any year recorded. The heavy storm of 26th and 27th gave a fall of snow of 25.5 inches, and as it was very wet and heavy, the quantity of moisture in that amount is far greater than would be in an ordinary snow-fall. It is yet too early to tell for a certainty what are the prospects for the coming crop of winter wheat, mostly hidden, as it is at the beginning of the present month, under the snow, but in some few places, where we have been able to observe the plants uncovered, they seem entirely killed out, probably from the effects of the hard freezing they got early in autumn. It is to be hoped, however, that the damage done is not so great as appearances indicate, and we shall be glad to get reliable information from different points on the subject as soon as the actual appearance and prospects of the winter wheat can be told with certainty.

TORONTO NURSERIES.—The well known and long established firm of George Leslie & Sons have issued their annual catalogue of fruit and ornamental trees and shrubs, bedding plants and flowers, &c., a list which seems to include everything in the horticultural department suitable to the climate of Canada. The pamphlet is prefaced by useful practical hints on transplanting.

FLEMING'S SALE LIST FOR 1870.—We have received a copy of this very complete list of flowering plants and fruit trees, comprising a large variety of dahlias, verbenas, fuchsias, geraniums, and other choice ornaments of the garden, besides a good selection of all the best grape vines and small fruits. We direct special attention to the various horticultural advertisements in the present issue.

CORRECTION.—In the advertisement of Clarke's Patent Two-horse Iron Field Cultivator, which appeared in the last two numbers of this journal, the address of the proprietor should have been HURTON, not *Hamilton*.

Horticulture.

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

Prize Essay—Award.

To the Directors of the Fruit Growers' Association of Ontario.

The committee appointed to render judgment upon the essays on small fruits have had placed in their hands three essays with the following mottoes, viz:

First. "In labor there is profit,"

Second. "Whatever tends to promote production, increases the wealth of any nation;"

Third. "Poma mitia;"

and now beg to report their award.

In their opinion they are confined to the consideration of the two first mentioned essays, since the third, bearing the motto "Poma mitia," contrary to the resolution offering a prize to the best essay on the raspberry, blackberry, strawberry and currant, treats only of the strawberry.

After a careful perusal of the two essays first above named, the committee have decided to award the First Prize to the essay bearing the motto "In labor there is profit," and the Second Prize to the essay endorsed with the motto "Whatever tends to promote production, increases the wealth of any nation."

The committee desire to express their opinion of the great merit and excellence of the essay to which the first prize has been awarded, and earnestly recommend its publication and a careful perusal of it by the public.

We beg to submit this award.

Given at Hamilton, this 21st day of February, 1870.

W. H. MILLS.

ROBERT BURNET.

W. HOLTON.

Secretary's Report

To the Directors of the Fruit Growers' Association of Ontario.

Gentlemen,—I have this day received the award of the committee appointed to read the essays that had been received in competition for the prizes offered by this Association, and to adjudge the prizes; and therefore I have proceeded to open the envelopes endorsed with the mottoes to which prizes were awarded, and find that the envelope endorsed with the motto "In labor there is profit" contains the name of William Saunders, Esq., of London; and the envelope bearing the motto "Whatever tends to increase production, increases the wealth of any nation" contains the name of David Nicol, Esq., of Cataraqui, Kingston.

Your ob't. servant,

D. W. BEADLE,

Secretary to Fruit Growers' Association of Ontario.

Prize Essay on the Raspberry, Blackberry, Strawberry, and Currant

BY W. SAUNDERS, LONDON, ONT.

THE RASPBERRY.

Our improved varieties of raspberry have all originated from two or three wild native or foreign species—the European sorts chiefly from "the European Raspberry" (*Rubus idaeus*)—or from the common wild red raspberry (*Rubus strigosus*), and the black raspberry (*Rubus occidentalis*). These have been improved chiefly by cultivation, selection, and hybridization or crossing. A number of plants have been raised from seed, and from these the most promising have been taken and cultivated, when fruited, fresh seeds have been obtained, sown, and subjected in turn to the same process of selection; or a hardy variety lacking flavour has been crossed with a tender high-flavoured sort, with the intention of raising, from the resulting seeds, plants inheriting the hardiness of the one, and yielding fruit possessing some portion of the delicate aroma of the other.

The soil best suited for the raspberry, and indeed for all the small fruits to be treated of in this essay, is a rich, moist, deep loam, inclining to clay rather than sand, well drained and thoroughly worked, either trenched with the spade or ploughed and subsoiled as deeply as possible. Such working, and, where the land has been at all previously exhausted, a liberal manuring, will place it in good heart to give strong growth to the plants placed in it. Individuals who are not favoured with such suitable soil may still grow good crops of fine fruit, even if the soil be very light and sandy; but in this case a far more liberal and continuous manuring will be needed, for the raspberry is a great feeder. It is useless to attempt to grow this, or any other of the small fruits we shall treat of, in a cold wet soil, for no amount of preparation short of thorough draining will remedy this defect.

With regard to the proper distance for planting, a difference of opinion exists; some advocating that the rows be placed four feet apart, others six feet or more. Where land is abundant, six feet, we think, is little enough, as this allows room for plenty of air and light, and also provides for horse-culture, which is a matter of considerable importance where a large piece is under cultivation. For similar reasons, in such a case we would advocate the placing of the plants four feet apart in the rows, rather than two, as this would allow of horse-culture the other way; for we are satisfied that there is nothing will tell so well on the health of the plants and abundance of the crop as a frequent stirring of the soil. Where land is scarce, as in the garden of the amateur, and it is desirable to crowd as much as possible into a small space, the rows may be reduced to three or four feet apart, and the plants from one to two feet in the rows, with fair results.

The red raspberry is propagated by suckers, which usually spring up in abundance from the roots of the plants as soon as they obtain good foothold in the soil. Some varieties sucker less readily than others—the Philadelphia, for example. Where it is wished to increase this propensity, a sharp spade should be thrust down into the soil all around the plant, to sever the roots, say a foot or less from the base of the plant, when the pieces of root thus cut remaining in the soil will usually throw up young plants in comparative abundance.

The black raspberries do not send up suckers, but are propagated by layering the tips of the canes. In the autumn the extremities of the canes lengthen much, become drooping and slender, finally touching the ground, and from this point sending out a mass of fibrous rootlets, soon developing, when undisturbed, into a vigorous plant; this, when well rooted, is severed from the parent by cutting the cane.

The spring is the proper time for planting. Then the well-rooted suckers or tips are dug up and transferred to their place in the new plantation, taking care not to expose the roots unnecessarily to drying winds or the heat of the sun. The rooted tips require no preparation in planting, but the stems of the suckers should be cut down within a few inches of the ground, so as to induce a strong shoot from the base for next year's fruiting. It is very unwise to attempt to obtain any fruit from raspberries the first year planted; with care a few berries may be ripened, but the fruiting process is an exhaustive one to the young plant, and it will often take years to recover from this foolish tax on its then limited resources. If the plants become well established the first year, a certain amount of fruit may be allowed the second without injury to the future prosperity of the plantation, but a full crop need not be expected until the third or fourth year.

Pruning.—Canes which have once borne fruit, bear no more. Hence, these should be removed as soon as the fruiting season is over, cut off close to the ground, so that the young canes may have more room and air. At the same time due regard must be paid to the thinning out of the new canes, removing all that promise to be weakly or slender. Since we depend on the strength of the current year's growth of wood for our next year's crop, any process which will conserve the vigour and concentrate the energies of the young plant is deserving of regard. Summer pruning and pinching we deem a valuable means to this end. The young plant, when it has attained about the height of three feet, should be pinched off at the tip; this will cause the side branches to develop, which in turn should be subject to similar treatment when from six to eight inches long. This pinching should be repeated if necessary, but should not be continued too late in the fall, since it would cause a late growth of tender wood which would suffer during

winter. It might be practised safely enough till about the beginning of September, and any subsequent growth not wanted might be removed by a light spring pruning. This method we regard as much less wasteful than that of allowing the summer's growth to proceed unchecked throughout the season, and then prune back in the spring to a proper height. By this latter method the plant is allowed to waste its strength in the unnecessary production of wood which must be removed, and the growth is often long and slender; while in the former case all its energies are concentrated in the development of a stocky, well-ripened cane, far better fitted to bear its destined weight of fruit the ensuing season. This treatment is equally applicable to the Black Caps, unless where it is desirable to raise new plants; then the natural extension of the cane, or portions of it, must be allowed.

Manures.—It is universally conceded that stable manure contains all the elements required to recuperate the soil, stimulate the energies and increase the vigour of growing plants, and since this is probably readily obtainable by all our readers, we shall not enter into the subject of special manures. Stable manure should be well rotted before being used. If spread out in flattened heaps about three feet deep, in fall or spring, and turned over several times during the summer following, keeping it properly supplied with moisture, it will be in good condition in the fall to apply to growing plants, and a small quantity thus well prepared will be found more than equal in its effect to a much larger quantity of such as is coarse and only half decomposed. In this latter condition, however, it often serves a good purpose as a mulch to protect the roots either from the severe tax of a summer's drought or the pinching cold of winter.

Picking and marketing fruit.—Women and children are usually engaged in picking berries, and paid either by the day or quart, most commonly the latter; the price averaging about one cent per quart. The pickers take to the grounds with them the quart wooden boxes in which they are to be shipped, and when they are filled carry them to a shed, or other suitable place near by, where they are enclosed in well-ventilated cases, holding from thirty to sixty quarts. The pickers receive tickets corresponding to the number of boxes they bring in, which are produced when the time for payment arrives. All small fruits should be gathered carefully, free from leaves and other dirt, and also free from unripe berries. The pernicious practice resorted to by some of placing a few fine specimens on the top of a box while below the fruit is inferior, should be carefully avoided. Such a course disgusts both dealer and consumer; the surface should fairly represent the interior. In some localities where large berries are appreciated, it would doubtless pay to select the fruit, separating what is

extra fine from the small and inferior; this applies particularly to strawberries. The latter would have to be sold at a reduced price; but the selected fruit would command a figure very much above the average, and the whole might thus be made more profitable. In all cases growers should avoid mixing their fruits; an assorted package, even if some of the varieties are superior, will seldom sell as readily as one the contents of which are uniform. All imperfect fruit should be rejected; half a dozen of such in a box will attract the attention of a purchaser far more readily than twice that number of extra good specimens. The best policy is to consign such to the pig-pen or the manure heap; reputation for quality is quite as valuable to the fruit grower as to any man in any other department of business.

Varieties.—These may be conveniently divided into three classes. 1st. Such red or yellow raspberries as are tender, and require winter protection; suited chiefly for amateur culture. 2nd. The hardy varieties, including some new ones claimed to be so, but as yet unproven in Canada. 3rd. The black raspberries.

Brinckle's Orange.—Of all raspberries we regard this as the finest. Its flavour, aroma, and appearance are equally charming and delicious. It is large, and of a beautiful orange yellow colour, and its full and slowly maturing crop supplies the table of the grower with a daily portion for three or four weeks. We think this variety might be grown with profit for a near market, but it is too soft to bear shipping far. In most parts of the country it would need winter covering; but in some of the more northern sections, where the snow lies deep and unbroken throughout the winter, if pruned low this would probably be a sufficient protection. In localities less favoured in this way, the canes might be allowed to grow moderately long, bent over as closely to the ground as possible without breaking, their tips covered with earth, and some loose litter—pea straw or light manure—thrown over them. The expense of covering an acre in this way would not be very great, and we think that the additional price the fruit would bring over any other variety would more than compensate for the extra labour.

Franconia is a large red variety of fine appearance and flavour, and very productive. In the milder portions of Canada, the Niagara district for example, it is hardy enough to stand most winters without injury, but it cannot be relied on in other sections away from the influence of the lakes. With me it has proved quite as tender as Brinckle's Orange.

Hornet—This is a still larger red fruit, very productive and of good flavour. Besides these we may enumerate the Fastolf, Belle de Fontenay, Red Antwerp, French, and Marvel of Four Seasons—all good varieties.

We now come to the second class, embracing those which will endure uninjured the cold of winter without protection.

Philadelphia—Of all the hardy varieties this has been most widely tested, and maintains its character for hardiness and productivity everywhere. It is dark red, medium to large in size, moderately firm, but very deficient in flavour, not equal we think in this respect to the wild fruit. We doubt very much whether this variety will pay for cultivation in localities where the wild fruit abounds, for although larger, it would necessarily be brought into competition with the native variety, and would hardly sell at a much higher price. A great deal would depend on how it was marketed.

Yellow Canada and Arnold's Red are two seedlings raised by Mr. Arnold, of Paris, Ont., which promise well. They are undoubtedly hardy, and are said to be very productive. They deserve fair trial, and we hope they will prove to be a valuable acquisition. Mr. Arnold merits great praise for his many efforts to improve our fruits.

Clarke—This new variety is highly esteemed in many parts of the United States on account of its hardiness, but we believe it has not yet been subjected to the test of our Canadian winters. The fruit is said to be large, light crimson, sweet and high flavoured. It is doubtless worthy of being tested.

Naomi—Much is said in favour of this new variety. In size and quality it is good, but it is doubtful if it will sustain the character claimed for it by its originators for hardiness.

Class 3rd—Black raspberries—The Doolittle Black Cap has been well tried throughout Canada, and has proved hardy and prolific. The berry is moderately large, black, with a slight bloom, sweet, juicy, and similar in flavour to the wild black-cap.

Mammoth Cluster, introduced to public notice by Furdy & Johnston, of Palmyra, N.Y., is doubtless an improvement on the Doolittle, being larger and more productive. We hope this berry will be extensively tried. Its period of ripening is just after the Doolittle.

Davison's Thornless is another new claimant for public favour, ripening about a week earlier than the Doolittle. The absence of thorns on the canes will be of great advantage in gathering the fruit.

Golden Thornless is a new yellow raspberry belonging to the same family, is nearly if not quite as large as the Mammoth Cluster, firm in texture, of handsome appearance, but deficient in flavour.

Although we have now enumerated many varieties, all of which possess some good points, we still feel that they all have their defects. We want a raspberry that will combine the good qualities—hardy, productive, large, juicy, moderately firm and high flavoured. Whether we shall ever attain to this degree of perfection, time alone will dis-

close. We sincerely believe it to be possible, and trust that the many labourers who are working to produce new varieties will never relax their efforts until something near this desired end is obtained.

Dr. Asa Gray, in his Manual of Botany, speaking of the black and red raspberries, says, "some curious forms are known, with fruit intermediate between these." We are not aware of any such in cultivation, but the fact of their being met with in a wild state would suggest the idea of a natural crossing of these two through the agency of insects. Might not some valuable varieties be similarly produced by the more intelligent workings of man? Here is an almost unexplored field for the enthusiastic fruit grower.

Insects—The raspberry is not without its insect enemies. A borer, the grub of a long horned beetle (*Oberca tripunctata*) burrows its way up and down the middle of the cane, weakening and destroying it. The beetle girdles with its jaws the new cane not far from the tip, in two places, one ring an inch or more below the other, and between these, in a puncture, the egg is deposited, which soon hatches into a grub, furnished with powerful jaws, and which at once enters on its destructive career. The tip above the upper ring on the young cane withers and droops, by which the presence of the enemy may be readily detected. The operations of the parent insect begin early in July, and continue for several weeks. By looking through the canes occasionally at this season, and removing all the withered tops, down to the lowest ring, this insect may be pretty well subdued, as it is never abundant. The worm lives in the cane, and undergoing its transformation there, appears as a beetle the following June.

A much more troublesome pest is the grub of the raspberry sawfly, a green worm covered with short green spines. This eats out the soft parts of the leaves, leaving the skeleton framework of tougher veins. There are two broods during the year. The fly deposits its eggs early in spring, on the under side of the young leaves, soon after they begin to expand, where they speedily hatch, and in a few weeks become full grown worms, about three quarters of an inch long. Entering the chrysalis state, just below the surface of the earth, they appear again by the middle of summer as perfect flies, deposit their eggs, and from these the second swarm is produced, the survivors of which pass the winter in chrysalis under ground. Hellebore is a sovereign remedy here; an ounce or so mixed with a pail of water and showered on the bushes with a watering pot makes short work of them.

The tree cricket (*Ecanthus niveus*) is another enemy—a green, active, grasshopper-looking creature, appearing late in the season and chirping merrily among the green leaves all the day. The female has a long ovipositor, which she thrusts more than half way through the cane, and by means of which

she introduces her long yellow eggs. A row of these, placed closely together, and occupying perhaps an inch or more of space, so weakens the stem that it readily breaks from its own weight as soon as the foliage appears in spring, and thus the crop is lost. We know of no method of destroying these as readily as that of cutting the affected portions out and burning them some time between fall and spring. They are readily discovered, appearing as a short seam with little raised dots on it.

THE BLACKBERRY.

Much that has been said about the raspberry applies equally well to the blackberry. The methods of raising new varieties—the soil and its preparation, proper distances for planting, propagation by suckers, time of planting, pruning, and insect enemies, all apply here and need not be repeated. It remains then only to treat of the varieties in cultivation. These, like the raspberry, have originated from our wild sorts, of which there are five or six species.

Lawton or New Rochelle, a very large juicy berry, moderately sweet when fully ripe. This variety has been tried in many parts of Canada, and usually proved a failure. The canes will not stand the winter, and their growth is too robust and thorny to admit of their being laid down for winter protection.

Wilson's Early—A new variety, said to be hardier than the Lawton, a very large, oblong, oval, firm, sweet berry, ripening earlier than the other varieties—will be a great acquisition if it will endure our winters.

Kittatinny—Also recently introduced to notice, and reported to be very hardy. Fruit large to very large, sweet and firm, a good grower, very promising, and should be extensively tried.

Sable Queen—This fruit was first offered to the public last year; it originated in Massachusetts, where it has stood the winters for some years. The fruit is fine looking and will doubtless be widely tested.

THE STRAWBERRY.

All our large and luscious strawberries, which charm the eye and delight the palate, have had their origin also in the wild vines of the woods. These wonderful changes have been brought about, too, by selection and hybridization, man assisting nature, as it is always his happy privilege to do. New varieties have thus been multiplied rapidly, until now their number is almost confusing.

Soil such as has been described as suitable for the raspberry is equally good for the strawberry, for although the wild vines are often found luxuriating in arid sandy spots, yet no fruit shows in grateful growth a readier appreciation of generous treatment than the strawberry. The richer the ground the heavier the crop, is a safe rule to go by, to any reasonable extent.

The vines are usually planted in rows, two.

three, or even four feet apart, with the plants set a foot apart in the rows. The wider distances are required when it is intended to use horse culture. The runners are cut off as fast as they appear, and the ground kept free from weeds. Before winter sets in, it is well to cover the entire surface with straw or other litter, removing it only from the crowns of the plants in spring, leaving it all on the ground until the fruiting season is over, as it will help to keep the earth moist and the fruit clean. After the berries are all picked, it will require removal and the ground well weeding and pulverizing, since it will have become very hard by the continuous tread of the fruit gatherers. The plants may be renewed after two crops have been taken by allowing the runners to spread over the surface, and plough under the old plants and nearly all else, leaving only a narrow strip of young plants every three or four feet. The ground after ploughing may be levelled with a cultivator.

The plants should be carefully set, not thrust into a hole with the roots compacted into a bundle, but in a natural position. Much of the success of a plantation will depend on proper attention to this point. Unless the vines can be got out quite early in the fall, so as to be well rooted before winter, we prefer spring as the season for planting. There is not much gained in point of time by late fall planting, and the plants are very likely to be injured by the severe frosts of winter.

Varieties—We think it is generally conceded that there is only one variety as yet in common cultivation which will really pay to cultivate for market purposes—that is, the Wilson's Albany. Every large producer in the country depends on it for his main crop. It is true, when compared with some other varieties, it is acid, and lacks flavour, but when well ripened it is not so far behind in these respects as some would have us believe. For our own part, we can eat Wilson's Albany, when we can get them, without making a wry face, and the general public seem to regard them with equal favour. Judging from the immense quantities which ever find a ready market

Many other varieties claim the attention of the amateur, some for their delicate flavour or aroma, others for their immense size but none of them, in my experience, come near the Wilson for productiveness. The following list embraces nearly all of much merit—Jacanda, Agriculturist, Bishop's Seedling, Nicanor, Charles Downing, French Ida, Downer, Hooker, Green Prolific, Golden Seeded, Ladies' Pine, Russell, La Constante, Trollope's, Victoria and Triumfede Gand.

The strawberry has not usually been much afflicted with insect pests. Occasionally the crop will be partially destroyed in some particular field by the ravages of cutworms, the caterpillars of some of our common moths or millers, or by the grub of the cockchafer or May beetle. But of late two new enemies

have appeared upon the scene which demand a few remarks, since, should they become generally troublesome, the profits of the strawberry crop would be much diminished. One of them is a leaf-roller, a small green caterpillar which rolls up the leaves and fastens the opening blossoms into a ball with silken threads, and living within consumes them. These are the progeny of a small yellowish moth, who lays her eggs upon the plants quite early in spring, so that the caterpillars become nearly full grown, and capable of most mischief, just at the time when the plant is coming into full flower. On one patch we examined the past season the damage from this cause alone would be moderately computed at half the crop. We have also observed this insect in several localities on the wild strawberry. The other is a borer, the issue of a still smaller brown moth, who lays her eggs on the crown of the plant late in July or early in August, which soon hatch into small reddish caterpillars, which burrow through the heart of the plant in various directions, through the fall and winter, either killing it outright or weakening it so much that it sends up in spring only puny barren shoots from about the base. Late in May, when the leaf roller is active and full of mischief, this twin brother in the work of destruction sleeps quietly in chrysalis, appearing in the winged state about the middle of July. The following remedies are suggested—Dusting with fresh air slaked lime, or with soot, or watering with hellebore, mixed as for the currant worm. These would certainly be of service, but whether they would singly or jointly entirely meet the case is a matter of doubt.

THE CURRANT.

Of these we have red, white, and black, varying in foliage and fruit and time of ripening, all requiring a rich soil, well worked and manured, to produce fine crops of large fruit.

They may all be propagated by cuttings, which are best made in the fall, tied in bundles and buried under ground during winter, and planted in spring. The young bushes of one to two years' growth should be planted out in rows, from five to six feet apart, and four feet in the rows. The pruning and management of the red and white currant is somewhat different from that required for the black. The fruit of the former is mainly produced on wood that is two or three years old, hence in pruning the new wood may be shortened considerably to induce the formation of strong fruit spurs, in the black variety the fruit is produced from one year old wood as well as from small spur-like shoots from the older, which should be borne in mind in pruning, so that a sufficient amount of wood of last year's growth be left to insure a full crop of fruit. In both cases a portion of the old wood should be removed from time to time, as well as some of the shoots or suckers, when they are likely to become crowded, so as to keep the head

open and admit light and air to the centre of the bush. The stool or bush form is the natural mode of growth for the currant, and is less trouble, and, we believe, far better than the method sometimes recommended of growing in tree form with a single stock. The chief objection to the latter is that should the currant borer visit this single stem the bush is lost, for the small hollowed trunk would necessarily break from its weight of foliage.

Varieties—The following are some of the best in cultivation.

Red Dutch—Fruit large, deep red, rich and good, bunches long and tapering, a vigorous grower and very productive, an old and well known sort.

Victoria—Fruit large, bright red, acid, but of good flavour, bunches very long and tapering, very productive.

Cherry—Fruit very large, dark red, acid, only second in quality, bunches vary much in size, this is the largest red currant in cultivation.

Versailles—Very closely resembling the Cherry, by some thought to be identical.

Prince Albert—Fruit large, bright red, rather acid, not rich in flavour, very productive, later than most of the other varieties, for which it is chiefly valued.

White Grape—Fruit large, yellowish white, transparent, juicy, moderately sweet and rich, bunches medium size, habit vigorous, very productive, the best white currant.

White Dutch—Fruit very similar in appearance and quality to the white grape, but somewhat smaller.

Black Naples—This variety has now almost entirely superseded the old English black. It is very large, black, sweet, with a peculiar musky flavour, bunches medium size, loose, a vigorous grower and productive.

Insects—There are several insect enemies, affecting chiefly the red and white varieties, with which almost every currant grower has to wage continuous battle, and so troublesome have they become of late that the culture of these valuable fruits has been sadly interfered with, many having given it up almost in despair. First in its destructive powers we would place the currant borer, a small whitish grub with brown head and legs, which lives in the stems of the bushes burrowing up and down, making them so hollow and weak as to be liable to break with every wind. The parent of this worm is a pretty little clear winged moth (*Exoria tipuiformis*) something like a wasp, with three gold bands across its body. The moths appear about the middle of June, flying in the day-time only, depositing their eggs singly near the buds, where they soon hatch into small worms, which eat their way to the middle of the stem, and there enter on their career of destruction. When mature they are about half an inch long; they live in the stems through the winter, change to chrysalis early in the spring, appearing as moths in

June again. These can best be kept within bounds by carefully removing in spring every stem found to be hollow, and burning it.

The caterpillar of a geometric moth (*Etiopia ribearia*) called a measuring worm, feeds on the leaves, when numerous stripping the bushes bare. Its colour is yellowish, dotted with black, with its sides streaked with white. It is about an inch long when full grown, and has its feet placed at each extremity of its body, so that in moving it loops itself up at every step. The moth from which this worm is produced is a delicate-looking creature, measuring about an inch across the wings, which are yellowish in colour, spotted with pale brown; the spots being arranged into one or two irregular bands extending across the wings. The eggs are usually deposited in May, but sometimes later. The worms are found during the month of June, and occasionally in July. The best remedies are hellebore and hand-picking.

The Gooseberry Saw-fly (*Nematus ventricosus*) also deposits its eggs on the currant leaves, and proves usually a much greater pest than the measuring worm. The perfect insect is a small fly nearly as big as a common house-fly, which appears early in spring, and deposits its eggs along the ribs on the under side of the new leaves as soon as they are sufficiently expanded. These speedily change to small green worms dotted with black, which at once begin to devour the leaves. They grow rapidly and are often so numerous as to strip a bush entirely bare in a few days. When fully grown they are about three-fourths of an inch long, and at their last moult lose their black dots, appearing in uniform pale yellowish green. They spin a small, tough, papery-looking cocoon, sometimes at or under the surface of the ground, at other times attached to the leaves or stems of the bush, from which the perfect insect escapes early in July. There are two regular broods during the season, and often a few odd specimens appear out of season, between times, so that constant vigilance is necessary to insure successful resistance to their repeated onslaughts. A ready means of destruction we have in powdered hellebore; an ounce of this well mixed with a pail of water, and applied with a watering pot, clears the bushes effectually in a very short time.

A green worm occasionally affects the fruit, drawing the berries together in a bunch, fastening them with silken threads, and consuming their contents. This, however, is seldom met with excepting on the gooseberry, and needs only a passing notice. Where they prove troublesome we can suggest nothing better than hand-picking.

THE BLACK CAP RASPBERRY seems to be a great novelty in Germany, and is now grown there with great success. Nothing was known of the fruit in that country until it was introduced from America.

Improvement of Native Flowers and Fruits

To the Editor.

SIR,—For years past I have been looking out for some articles or communications in our horticultural periodicals upon this interesting subject, and with the hope of inducing some young persons to enter upon this pleasing field of labour, I beg to offer a few remarks, feeling assured that no real lover of the beautiful who has strolled through our native forests in the summer season, can fail to have been struck with the beauty and brilliancy of our native flowers, and the rich foliage and frost-defying hardiness of our native fruits. In many of our town, village, and country burying grounds, what noble specimens of native flowers and fruits are frequently to be found. In a graveyard not far from where I write there is a neglected spot set apart for the interment of the poor and the stranger. Upon some of these graves there has sprung up spontaneously a luxuriant cluster of wild roses, with their roots running together in a thick entangled mass, and in the summer season, instead of there being a few straggling flowers, there is a perfect sheet of beautiful, though single flowers, and in the fall an abundance of fruit for the birds. Not many rods from this are the graves of persons of wealth, where many exotic flowers are planted, and cultivated every year at considerable expense. Here, for instance, stands the rose "Giant of Battles," but the poor giant is a dwarf beside the wild roses, and is every winter cut down to within a few inches of the ground by frost, while the wild roses have stood there for years, bidding defiance to twenty degrees below zero, with no cultivation or protection whatever.

I was very highly pleased with the article in your columns in February, from that veteran florist, William Paul, of Waltham Cross, England, and hope every lover of his country amongst us will see it and read it thoroughly, and then transfer the instructions there given on crossing plants in England to our own indigenous flowers. It will be well also to look around and see if there are not many things besides those that are valued for their flowers only, to which these instructions will apply. Consider, for instance, our numerous native nut bearing trees, and say can these not be improved by crossing with some better European varieties. Look again at the various members of the cotton family that spring up spontaneously in many localities in this northern portion of America. I ask can these not also be crossed with the cotton of the south, and yet preserve the hardiness of the one with all the good cotton yielding qualities of the other? I feel confident they can.

The greatest difficulty that stands in the way of these improvements is to find men willing to devote their time and means to this purpose. Perhaps it may be just as well to look some of the discouragements to this un-

dertaking in the face in the outset. One of these, and perhaps not the least to some sensitive persons, is a class of jealous, narrow, contracted little souls that will meanly insinuate that we are prompted by no higher motive than a desire of pecuniary gain. Of this class of persons I would say, let them alone, and rest assured that when the improvements suggested shall become a reality (which they most assuredly will if persevered in) these dog-in-the-manger men will be the loudest in their acclamations of praise, provided they are only allowed a share in the honours.

I have long been of opinion that in whatever country nature has planted varieties of any of her numerous orders of plants, there, that family, by judicious crossing, and proper cultivation, can be raised to a high degree of perfection. That the improvement will be attended with some difficulty and much labour and expense there is no doubt, but if the one hundredth part of the money that has been spent these last twenty years in procuring useless varieties of fruits, flowers, cereals and vegetables from Europe had been spent in improving our own native or acclimatized ones, horticulture and agriculture in Canada would occupy a much higher position to-day than they now do. Not that I would discourage testing the productions of other countries by any means, but it would be folly to deny that ninety-nine out of every hundred of the fruits, flowers, cereals and vegetables that succeed well in the British Isles, when planted in Canadian soil and climate are a total failure.

CHAS. ARNOLD.

Paris, Feb. 24.

How to Prevent the Attacks of the Apple Tree Borer.

At about the end of May or the beginning of June, according to the warmth of the weather, the winged beetles of the Apple Tree Borer begin to deposit their eggs on the bark of the tree. They do this at night, depositing only one in a place, selecting sometimes the forks of the main branches, but more commonly the trunk of the tree near the ground.

If, then, at about the first of May the whole of the trunk of the tree, up to and including the forks of the main branches, be thoroughly washed with cold-made soft soap, or well covered with whitewash, or even well washed with a solution of potash, the alkali will kill the eggs, or the young grubs as soon as hatched, if the female insect should chance to deposit them on the tree. But insects are all endowed with most wonderful instincts, and it is very doubtful whether the parent beetle ever deposits her eggs on a tree that is thus covered with a strong alkali. Those who have tried this preventive unite in saying that the trees thus treated are never attacked by borers of any kind, but remain sound and safe.

How to Destroy Bark Lice.

As a usual thing these insects are most abundant on unhealthy trees, but sometimes the tree might recover were it not for the debilitating effect of these insects. In some parts of the country there is considerable complaint of these bark lice, and it is quite possible that they should fasten upon a healthy tree in such numbers as to seriously impair the health of the tree.

When they are not very numerous, a wash of cold-made soft soap, or of a solution of potash, or even a thorough white-washing with lime white-wash, will be found quite sufficient to rid the tree of their presence. But when they have become very numerous, it has been found to be more surely destructive to prepare a mixture by boiling leaf tobacco in very strong lye until it is reduced to an impalpable pulp, and then mix it with cold-made soft soap until it is about as thick as good paint, and then put it on with a paint brush to every part of the tree, trunk, branches, limbs, and twigs, quite early in the spring, before the buds are much swollen. This application, if thoroughly put on, will surely be the death of every bark louse.

Fruit-growing in the Ottawa Region.

The report of the Fruit Growers' Association of Ontario contains a summary of the information obtained from the counties of Renfrew, Carleton, north part of Lanark, Russell and Prescott, from which we learn that the apples to be planted there should be of the most hardy kinds, such as the several varieties of crab-apples, the Snow-apple, Duchess of Oldenburg, Red Astracan and Northern Spy. The Baldwin and Rhode Island Greening are spoken of as being too tender, the trees being often winter-killed, or so injured by the severity of the climate as to fall easy victims to injurious insects.

Pear trees have not succeeded well, on account of the extreme cold. The varieties which have in some measure succeeded are the Flemish Beauty and Stillwell. The latter named variety may be some local sort that has been found to be worth cultivating on account of its hardiness, but it is not described or named in American pomological works.

The plum tree seems to endure the climate somewhat better, and in some seasons bears immense crops of fruit. The black knot is troublesome there, as almost everywhere else. The curculio too is found there, stinging the fruit and causing it to drop off before it is ripe. In some seasons the fruit seems to burst after it is set, swelling out into a mere puff ball and then dropping off. Yet, after all, it seems to be fully as reliable as any of the fruit trees.

Cherries, particularly the sweet varieties, do not endure the climate; the Red Kentish is grown to some extent, and there are wild varieties.

The peach, quince, apricot and nectarine cannot be grown.

The small fruits have not received much attention. Strawberries, raspberries, and currants will all thrive well, and bear fine crops of fruit. Blackberries grow wild in great abundance. The English gooseberries, on light, sandy soils, mildew badly, less on low, heavy land.

Grapes have not been tried to any extent, and there is much confusion and contradiction in the information concerning them. It does not seem to be possible that the Isabella and Catawba should usually ripen there, yet such is the testimony of one gentleman. We must wait for further experiments.

The soils best suited to fruit trees are those that are lightest and warmest. All attempts to grow orchards on clay land have been unsuccessful.

Protecting Trees from Mice.

To the Editor.

SIR.—Can you inform me if there is any efficient method of preventing the destruction of young apple trees in the winter from mice girdling them? I have stamped the snow down around them several times this winter, and yet I now find that several valuable young trees in bearing are completely girdled upwards of a foot from the ground. I have in vain tried to trap the mice. Would painting the trees in the autumn with some liquid be of any use, say tar? or would the application injure the trees? I find some pear and apple trees of three inches diameter utterly destroyed.

HENRY BORINGEARTH.

REPLY BY HORT. EDITOR.—If a cone of earth is raised around the trunk of the trees to such a height that the top of the cone will be above the snow, the mice will not girdle the trees, because they always work under the snow. This cone of earth must be placed around the trees early in the fall, before the ground freezes. If the snow usually lies too deep on the ground to admit of such a cone of earth being raised around the trees, then the trunk may be covered with sheets of brown paper tied on with a string to a height that will be above the snow line, and then coal-tar painted on the brown paper. The direct application of the coal-tar to the trees has been found to be injurious to them. If coal-tar can not be had, the paper may be painted with any cheap paint and sanded while the paint is wet. The paper should be stout enough to admit of being painted.

TRIMMING HEDGES.—"Nescius" asks what is the proper time for trimming certain kinds of hedges. Buckthorn, Hawthorn, Privet, and Honey Locust require to be trimmed in April and July in order to be neatly kept; the Sweet Briar only in spring; and the Norway Spruce should be shortened in with the knife, not trimmed with the shears, in the early part of June.

Packing Apples for Long Voyages.

Those who read the discussions on the packing of apples, at the last meeting of the Fruit Growers' Association, will remember Mr. Ball's statement of his method of packing, and that some gentlemen thought that he did not press the fruit in sufficiently tight. We have been privileged to see a letter to Mr. Ball from his consignees in Scotland, dated February 3rd, 1870, in which they say, "Your good and honest packing is a great help to us, and indeed we would rather want apples entirely than have barrels good only on the top, and unfair and even bad below, as some ship them. It is our custom to refer to your careful packing and your honest packing as a model to all others. The barrels open as good and tight as when they left your store. Please on no account remit your vigilance and care."

From this it will be seen that Mr. Ball's mode of packing ensures the safe arrival of the fruit, and that they are pressed down sufficiently tight for all necessary purposes.

But we have craved the privilege of making these extracts from the letter, not merely to show that by his method of packing the fruit is kept in good order, but chiefly to impress upon our fruit growers the importance of carefully selecting their fruit, and never allowing any of inferior quality to get into the barrels. The attempt to put off an inferior sample by mixing it in the body of the barrel with fine fruit is sure to be detected, and to be visited upon the dishonest packer in the end.

The New Rose—Madame La Baronne de Rothschild.

We have just been favoured with the privilege of seeing this truly superb rose, which was imported from England last autumn and bloomed in the house. No wonder that it received a first-class certificate from the Royal Horticultural Society, England. In habit the plant is very robust, and judging from the number of buds now formed and forming, it should be a free bloomer. The colour at this time is a most beautiful clear deep rose, and the flower large and double. This rose has the reputation in Europe of being one of the best, if not the best, of its colour.

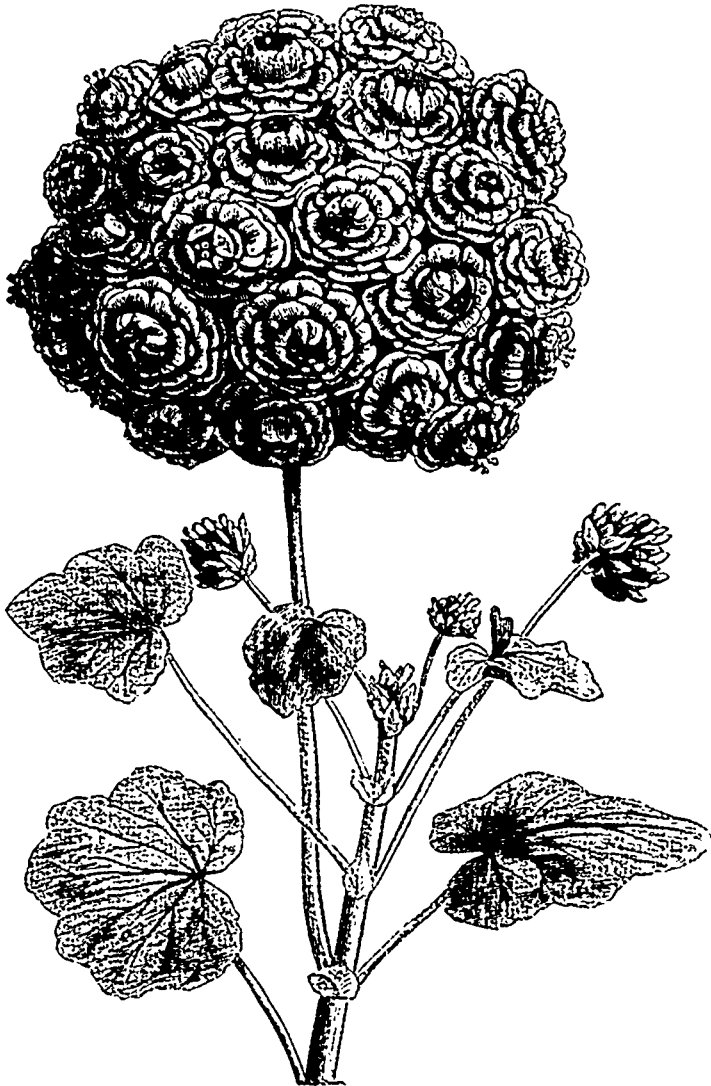
Currants and Gooseberries.

A fruit seller of New York City, writing for the *Rural New Yorker*, calls attention to these fruits on account of the ease with which they can be cultivated and marketed. Gooseberries sell in that market at from three to five dollars per bushel. Currants sold last year at from ten to fifteen cents per pound, commanding a ready sale at these prices. They can be shipped in grape boxes with entire safety, and arrive in good order. Will some of our readers residing in the cities of Ontario inform our readers whether these fruits command a ready sale with us, and what are the ruling prices in Toronto, Hamilton, London, etc?

Double Geraniums.

We have been so much pleased with these great acquisitions to our summer flower beds that we have had an engraving made of a flower truss, in order to give our readers some idea of what exceedingly beautiful things they are. The engraving is about one half the natural size.

These double geraniums possess the advantage of holding their bloom much longer than the single varieties. In some the flower truss is remarkably large, containing from sixty to eighty blossoms, and in colour as rich as a Provence Rose. Gloire de Nancy is of a rosy carmine, Le Vesuve is an orange scarlet, Madame Le-



moine is a bright rose colour, Victor is bright orange scarlet, striped and flaked with white, and Victor Lemoine is of the finest scarlet. These varieties are now grown in Canada, and can be had of our nurserymen and florists.

THE CONCORD GRAPE.—A correspondent of the *Rural New Yorker*, writing from Montgomery county, New York, says that the Concord grape stands first, is hardy, well adapted to our severe winters, bears full and ripens early. The Isabella is too often cut off by the early frosts to be reliable.

Tomatoes.

A correspondent of the *Rural New Yorker* states that he has found these plants grown in boxes in the kitchen window and transplanted a few times, though only a few inches high when set out, would ripen their fruit quite as early as large plants of the same variety, grown in pots and purchased of the market gardeners. He therefore concludes that age, not size, is what is wanted.

He also states that he has grown, with much care, many varieties, and has found the Eureka and Keyes' Prolific ripen first, and the Early York and Tilden follow, while but very little behind either of these comes the Large Smooth Red, a variety much to be preferred every way for a general crop. He would give

Trees for Shelter.

To the Editor.

SIR,—In the January number of the CANADA FARMER there is an article on the Norway Spruce. Now, as I have experimented a good deal in a small way in planting the "Greenwood Tree," perhaps you will give space for a few lines on my experience. The Norway Spruce is a noble tree, and if transplanted young, after the first two or three years grows very fast and is quite hardy, and if allowed plenty of room makes a very handsome tree. I planted mine in land trenched about eighteen inches deep, and as they were not numerous I took great care of them the first year, watering and mulching, and so lost none of them; I only have some two dozen altogether. I gave them an application of black peaty soil mixed with good fresh house ashes the second year, which they seemed to approve of highly. I have also some Canadian Spruce, almost, if not quite, identical with the Norway kind, and, I think, just as handsome. The "Norways" were got at Guelph nurseries; the "Canadians" in the bush. I have also a good many Balsams from the bush, and I really think they are as handsome as the Spruce. The Cedar is a good tree either for ornament or shelter, and is all the better for being clipped. The Tamarac, or Larch, is a very pretty tree, and is hardy, but likes moisture. Clipping improves it also when young. I had some in rather dry spots, and the hot, dry summer of 1858 killed several of them. None of my planted trees are over twenty years old. Some years they threw out leaders from twenty inches to two feet long, but in 1859, the year of the dreadful summer frosts, they hardly grew at all, and the pretty shoots of June were hanging in October like brown tassels. The Hemlock is the most tender of the Canadian evergreen trees, which is a great pity, as it is a beautiful tree, very like the Yew tree; it does not bear transplanting well, and the field mice girdle it when young. I cannot see your objection to calling a Spruce a Fir. In Scotland it was called a Fir, and the Silver Fir and the Scotch Fir, the handsomest, or grandest rather, of the whole lot. Pine may be more fashionable, and I went to see a beautiful *Pinetum* in Gloucestershire some ten years ago. The Latin names were there, of course, which about one in every fifty understands, but there was the "Scotch Fir," "Silver Fir," "Spruce Fir," and so forth, on the labels as well as the Latin names.

I got a belt of evergreen trees planted in the grass. At least the half of them died, but the rest are thriving nicely now, and some of them are large handsome trees, all Canadian from the bush. I have seen the Canadian Spruce used for a hedge, and it does very well. With regard to ornamental hedges, the common purple lilac makes a capital hedge. It is the first shrub almost to grow green in Spring, and keeps green till the snow falls, and a lilac hedge in full bloom is something worth seeing as well as smelling. The lilac

the preference to the Tilden but for its uniform tendency to crack. Lester's Perfected is the latest in ripening of any of the sorts he has cultivated.

Our own experience of last summer leads us to expect that the General Grant will prove a formidable rival to the Large Smooth Red. In solidity, flavour, and early maturity under unfavourable wet cold weather, it excelled even the Large Smooth Red, which has hitherto been our favourite variety. But the experience of one season is not sufficient to establish a reputation over one that has been so long tried and found to be reliable.

will grow anywhere; in fact, you cannot kill it, and it is a strong, tough bush. The cows eat the shoots when tender, but a summer's rest will more than make up the damage I would not like, however, to trust it by itself, or indeed almost any other hedge, as the cattle are very troublesome, and when annoyed by flies, I have seen them rush into a good big thorn bush just for the sake of a good scratching. If you wish another yarn on trees I will be happy to give you one; all I give is from my own practical experience.

Fergus. F.

NOTE BY THE HORTICULTURAL EDITOR.—Our correspondent "F" will please continue his very interesting letters. Actual experience is what is wanted: the success or failure of an intelligent planter is a guide to others. Does the Hemlock suffer from the severity of the winter at Fergus, or is the tenderness only the difficulty of transplanting? If the latter, that can be obviated by taking very small plants from the forest, and planting them in nursery rows, and shifting them two or three times before they are finally planted.

The objection to calling a "Spruce" a "Fir" is just the confusion that arises when one name is applied to two things that are really different. Botanists have classified the evergreens under the genera of Pines, Spruces, Hemlock Spruces, Firs, Cedars, etc. Now, if a correspondent calls the White Spruce the Fir, a reader is misled, and applies what is said to the wrong tree. There is need, therefore, of care to give the correct name of the tree about which we are writing.

Will not our correspondent plant out a Pinetum of such evergreens as promise to endure our climate, and give the results of his experiments to the public? We promise him much pleasure in the care of them, and such aid as it may be in our power to give.

Grape Queries

To the Editor.

SIR,—Would you allow me to answer several questions through the medium of your widely circulated journal? Many persons have written to me for information about grapes, asking what kinds to plant, &c. It would be difficult for me to write to every one, and so, if you think the following hints and suggestions of sufficient interest, you can publish them:—

1st. Which are the finest and showiest grapes for exhibition?

The largest and finest looking grapes of my collection of seventy varieties is the Ontario. I have grown them three and a quarter inches in circumference to a single berry. But in my vineyard of seven thousand vines I have not a single Ontario, because it is too tender. The Iona also is a large and showy cluster, and Allen's Hybrid is also a large and beautiful cluster. These three are all magnificent looking—black, red and white.

2nd. Which is best for market? This is a difficult question. I would give five thou-

sand dollars to-day to know for a certainty which three kinds of grapes to plant to make the most money out of them, in a space of say twenty years. However, we are learning in the school of experience in this matter, and some of us have had to pay pretty dearly for such learning. I have had my twenty years of experience, and have about concluded that of the older and tried sorts, Concord and Delaware will give you most money. As to the new sorts, if I were to advise your readers to plant any of them, I am sure that fifty others, of perhaps equal opportunities to judge, would certainly differ from me, and so I say, try for yourselves.

3rd. Can we not grow a few of the finer foreign sorts—say Muscat of Alexandria, or the White Nice—in Canada, if we put them on the south side of a wall or building, and protect in winter?

I reply that I think it of little use to try; better try the natives out of doors; put your foreigners in the hot-houses.

I will note a few of our new grapes now before the public, but caution your readers to remember that their trial has only been for a short time, and in my own locality:—

Iona—Seems quite uncertain: sometimes fine, but generally does not ripen.

Creveling—Of first quality, and will surely ripen in Canada every season. Its great fault is that it generally gives poor clusters, but the berries are large.

Rogers, 4, 15, 19—General character very much like the Creveling.

Hartford Prolific—Very early; will always ripen in Canada; rather coarse quality, and in wet seasons drops from the bunch.

Israella—Very fair and early; not as strong growers as the others mentioned above.

4th. Where can we get good vines?

We have several good nurseries in the Dominion. I think all the varieties I have mentioned could be bought of any of our nurserymen or vineyardists.

J. C. KILBORN.

Beamsville.

Best Method of Training Apple Trees in Cold Climates and Exposed Situations.

It is said of Dr. John A. Kennicott, that no man has ever yet lived who had as good a knowledge of the form of tree that was requisite to enable it to withstand the great extremes of temperature, and the cold, bleak winds that prevail on the prairies of the West, and he said that the very best protection to an orchard on the bleak prairies is to make the branches low down, so as to cover up the entire trunk of the tree until the rough bark is formed.

These views of Dr. Kennicott are not without confirmation by observing fruit growers in our own Ontario. Mr John Fisher, of the Township of Plympton, County of Lambton, says in a letter to the Secretary of the Fruit Growers' Association, written in 1862, "trees that are allowed to branch out low, say about

three or four feet from the ground, are generally healthy, but those that have a long trunk are sure to get black on the south-west side, and soon die off."

Mr. L. Crosby, of Markham, in the County of York, writing about the same time, spoke of the importance of protecting the trunks of the trees.

Have any of our readers seen any orchards in the colder parts of the Province which have been trained with low branches? If any know of such, and can state the effect, beneficial or otherwise, we should be most happy to receive their communications. There is much need of some protection to the trunks of the apple trees in cold and exposed places. How best to secure that protection is a question of absorbing interest to all fruit growers whose lot is cast in the bleak parts of the country.

What Causes Failure of the Peach Crop?

To the Editor.

SIR,—You have frequently asked me to give you the result of my horticultural memoranda, if anything struck me as likely to be useful to the enquiring horticulturist.

For some years it has been a disputed point as to what affects the peach crop. My own conviction inclines to the degree of cold. Others, however, are in favour of the destructive influence of storms forming a crust of ice on the tree, and thus destroying the germ.

For the purpose of ascertaining if my theory were the correct one, I have kept a memorandum of the weather and the peach crops for many years, and I have invariably found that when the thermometer goes below 10°, the peach blossom bud is destroyed; the leaf bud appears able to resist a greater degree of cold, or the trees themselves would be killed. I have also found that the mere fact of ice forming on the trees does not affect them without the degree of cold necessary to kill the bud, which I contend is 10° or below. For instance, in 1862, on the 15th March, we had a very remarkable storm of sleet, forming ice one-half to three-quarters of an inch thick on every limb and twig, causing great destruction amongst all trees and shrubs. My old peach trees were nearly all broken down. This, I find, on referring to my memoranda, was a "remarkably fine fruit year; peach trees full of fruit." In February, 1869, we had a similar storm, but not so violent. Last year, although not a good peach year, "the crop was very fair." If we have a good crop of peaches the coming season, I think the question will be pretty well settled; and I also think that if you would call the attention of the horticultural world to a discussion of this question, it will settle another question, as to what degree of cold the peach will bear without injury.

Would it not be a good subject for discussion at a meeting of the Fruit Growers' Association?

JAMES TAYLOR.

St. Catharines, March 2, 1870.

Lombardy Poplars for Wind-breaks.*To the Editor.*

SIR,—Mr. Mitchell states that Lombardy Poplar is one of the best wind-breaks for an orchard. I question the propriety of planting wind-breaks for orchards. It takes five or six years before it is of sufficient height to protect anything; by that time the apple trees are large enough to take care of themselves. When bearing, if well sheltered, the buds will open early in spring, and the young fruit will be cut by the frost and spoil the crop; whereas, if not sheltered, the buds would not burst before all danger of frost is over. Mr. Mitchell will find that twenty-five feet would not prevent the roots of his poplars from reaching his apple trees. I have seen the row of trees adjoining the poplars droop and die, in consequence of the poplars' roots exhausting the soil. I would recommend Mr. Mitchell to use the plough to cut the roots off the poplars, or otherwise he will find that they will rob his apple trees.

R. H. SARVIS.

Hibbert.

NOTE BY ED.—If he does run such a furrow, and cut off poplar roots of any size, he will surely have a row of young trees come up in the furrow, for every broken root will throw up sprouts.

Evergreens for Farmers.

It is a fact which ought not to be, that more evergreens are planted in our villages and cities, than in the country by farmers. The evergreen is essentially a protective tree against cold and wind, more becoming in winter than summer, and in proportion as the weather is severe and the aspect of the landscape bleak and forbidding, does its presence add comfort and cheerfulness. About country places, in northern latitudes, where there is ample room for both deciduous and evergreen trees, hardly too many of the latter can be planted. They should be freely set in lines about the grounds of the dwelling, the outbuildings, garden and orchards, to form wind-breaks, and add warmth, shelter, and a snug, cosy look to the scene in winter.

Where shelter is the main object in view, and the planter is not cramped for space, a belt should be set, at least one rod wide, and in many situations large groups could be formed with the best results. For every purpose and situation there is no other evergreen which equals the well-known Norway Spruce. Although it is one of the giants of the forest in a state of nature, yet this species bears pruning, and may be relied on when planted thick and sheared into hedge form. For wide belts and groups the Scotch, White, and Austrian Pines are likewise excellent.

Success in growing a fine hedge depends very much on making the right beginning. Trees of nearly even size should be selected, although some irregularity may be corrected by after pruning. The lower branches

should lie upon the ground. No after treatment can remedy the defect of a naked trunk. They should not be too large, and great care should be taken to keep the roots intact and from exposure to sun and wind. From the middle to the end of spring is the best time of the year for transplanting.

Another very important use of evergreens in the country is to form barriers along the sides of roads that are liable to be filled with snow-drifts. A double line of trees, set five or six feet apart in the row, and the rows placed half a rod asunder, would, in five years, afford complete protection against drifting snow. Railroads might be cheaply and most effectually barricaded against drifts in this manner.—*Rural New Yorker.*

THE FILDERKRAUT CABBAGE.—James Vick says that no cabbage with which he is acquainted has given such general satisfaction as the Filderkraut. It is very conical or "sugar-loaf" in form, is very solid, and keeps well. It forms a solid head even under unfavourable circumstances, and scarce three plants out of an acre fail to make a fair marketable head.

DAVIDSON'S THORNLESS RASPBERRY.—Mr. H. Collins, writing to the *Gardeners' Monthly*, says that the fruit of this variety is large and fine, earlier than the Doolittle, matures its whole crop, while the later berries of the Doolittle are so small and dried up as not to be worth picking, and that the comfort of picking from plants that are free from thorns is no small consideration.

THE SLUG which appears on the leaves of the pear, plum and cherry, usually on the upper surface, can be easily destroyed by dusting the tree thoroughly with slaked lime or unleached wood ashes, as often as the slugs make their appearance. Indeed, the dry dust from the surface of the ground, if thrown with a little force upon them, will usually kill them.

THE LOGAN GRAPE.—It bears full and ripens, colouring the earliest of any grape I have. It is not as sweet as some, but in view of its hardiness, and the fact, too, that the fruit is not injured by light frosts, I cannot but regard it as a valuable variety. It bears the winter well. Still, the hardiest here needs some protection in cold weather, at least laying down and being kept close to the ground.—M. Quinby, in the *Rural New Yorker.*

TOMATOES.—Sow in boxes of about two feet by one and a half, and six inches deep, in earth of the richest kind. Cover the seed half an inch deep. If you have a hotbed, place this box in it; if not, set it in a warm room, near a sunny window. Water occasionally. When the plants are an inch or two high thin them out to about an inch apart. So soon as the weather is free of frost, transplant in moderately good garden soil, not rich, as that would make fine vines, but poor fruit.—*Rural New Yorker.*

GRAPE VINES AND PEAR TREES IN EKFRID, WEST RIDING OF MIDDLESEX.—I have a number of grape vines in cultivation, principally Clinton and Delaware. The Clinton has mildewed as well as the Salem. The others have so far kept healthy, contrary to what is generally reported, that those of the *Labrusca* species are most subject to mildew. The pear blight with me affects only some kinds, the others are exempt. The Tyson invariably blights very badly, while the Flemish Beauty, although only twenty feet from the Tyson, is as healthy and thrifty as a Lombardy Poplar.—W. G., in *Fruit Growers' Report.*

NEW ROSE, PRINCESS CHRISTIAN.—This has received three first class certificates during the year 1869, from the Royal Horticultural Society, Royal Botanic Society, and at the Crystal Palace Rose Show, and has been thought worthy of a coloured plate in the *Florist and Pomologist* for January, 1870. It is described as being a very large flower, globular in the bud state, and finely cupped when expanded, the colour ranging from deep salmon to rosy peach, according to the age of the flowers, and holding on clear and bright to the last. It blooms continuously and abundantly from June to November, is robust, and of a hardy constitution. It is introduced by Mr. William Paul, of Waltham Cross, near London, England, and will be sent out by him this spring. We hope our rose fanciers will keep their eye on it, and that we shall soon have the pleasure of seeing it in Canada.

APPLES IN GILFORD (South Riding of Simeoe).—Mr. Thomas Maconchy reports that the American Golden Russet and the Roxbury Russet bear well. That the Baldwin and Colvert, both as standards and dwarfs, are very fine; that the Duchess of Oldenburgh and Early Harvest do very well; the Spitzenberg and Snow-apple are good, and Gravenstein very good; the Keswick Codlin is prolific; the King of Tompkins is very fine—extra; the Pomme Grise a shy bearer; Northern Spy very good; Primate good and bears well; Red Astrachan very fine; R. I. Greening pretty fair, and St. Lawrence very good.

THE BEST SUMMER APPLE.—At the winter meeting of the Western New York Horticultural Society, the Red Astrachan was proposed by several of the most distinguished horticulturists as the best summer apple. A few of the members objected to it on the ground that it did not ripen its crop at one time, but extended its period of ripening over several weeks; while others valued it on that very account, its gradual ripening enabling them to market all the fruit without occasioning a glut in the market. The fruit dealers spoke of its handsome colour, which made it sell well; a few complained that the fruit with them was imperfect. F. R. Elliott, of Cleveland, Ohio, said it was one of the best market varieties at the West. We believe this variety succeeds well in all parts of Ontario, particularly in the colder parts, and on clay soils, and is one of the best, if not the best summer apple we have.

Apiary.

Bees, their Nature and Habits.

ARTIFICIAL IMPREGNATION.

According to a promise made in my last, I now publish what is claimed to be a new discovery for securing "artificial impregnation," in other words, a method whereby a queen may be caused to mate with selected drones. I give the method or experience of Mr. Freeman Moore, as written by himself, and published in the *Bee-keeper's Journal*, reserving any further comments of my own. He says:—

"I suffered great loss of time and sad disappointments in having my young Italian queens mate with the black drones of my neighbours, thus producing a hybrid progeny, which was, of course, worse than useless to me, and I resolved to try some plan whereby my young queens might be fertilized by drones of my own selection. Various were the plans I tried, but all failed, except in one instance, when I had a young wingless queen fertilized by one of the many experiments I subjected her to; but as I saw no evident signs of fertility at the time, I released her into a well stocked nucleus, and set about inventing some other plan. After trying various contrivances of no importance, as I have since learned, I opened the small box containing this invalid queen, and to my surprise, she had filled nearly all the cells in a central card of worker comb. I carefully examined and found the eggs regularly deposited in the cells, and not having the appearance of being deposited by a drone-laying queen. I carefully closed the box to await the result, and in twenty-one days worker bees emerged, and none but workers. This now convinced me that something new was to be learned, yet I was but little better off now than at first, for I had no idea which plan was the successful one. One thing I could rely on was, that this circumstance proved beyond all doubt that it was possible to fertilize queens in confinement, even if they were hatched without wings. That I stood alone in this discovery I had no doubt, for long since it has been publicly taught and admitted as an established fact, that young queens are fecundated only on the wing high up in the air, and all imperfect ones that cannot fly are incapable of impregnation. About this time, through some correspondence with Mrs. Tupper, she informed me that she had also for years been trying similar experiments, with very satisfactory results. It is encouraged me to make known to her the results of my experiment, asking her counsel and aid in fully developing this new theory. My first experiment was as already related; the second was precisely the same as Mr. Henry Atherton had related to me some years previous. I will give his own account in substance.

'I purchased a colony of bees that had

swarmed twice, and on examining the second swarm, found three or four young queens during the process of hiving. I caught one of them, put her into a tumbler, set it in the window, where the sun shone nicely, and as I concluded she would be lonesome alone, I caught two drones because they could not sting me, and put them in the same tumbler with her. Almost as soon as I released the drones (he said with an oath) the queen fell on one of them and instantly stung him to death.' I remarked that this certainly was a mistake, as they never used their stings except on rival queens. He again with a greater oath declared that he knew better, for he saw that queen '*sting that drone stone dead*,' and was unable to extract her sting without tearing out her own entrails. Still, he said, the queen lived, and he released her into a swarm with her intestines still protruding.

"From this circumstance the reader can easily divine my convictions, that it was a case of fertilization beyond all doubt, as it is a known fact that the drone dies suddenly in the act of copulation, the genital organs adhering to the queen. As my friend was entirely ignorant of the natural history and instincts of the bee, he had confounded these widely different acts. I simply give this to do justice to my friend Atherton, for had it not been for this remarkable circumstance I should probably never have thought of investigating the subject.

"I now give the exact course I pursued. Having found, about one o'clock in the afternoon, a young queen of extraordinary beauty before one of my hives which had reared a young queen, and this was about the eighth day after hatching, I lifted her up and found her wings deficient. I well knew that she never could fly, and took her as a subject for experiment. Knowing that she left the hive on her wedding excursion, and had fallen to the ground when attempting to soar aloft into the air in pursuit of the drones, and believing that this was the proper time to secure success, I at once caught four or five extra drones, and entering the house took a wine glass and placed it in a window where the sun shone brightly, and put the queen and drones therein. The drones flew in the glass to escape, and the queen tried to fly, but could only hop and flutter. She noticed the drones, but they paid no attention to her, and in a short time they quieted down and stood still on the bottom by her side. I then became discouraged and gave up all hope of success, and to make it worse, my mother laughed at and made fun of me. I left the room chagrined and vexed to think that I had thus failed and become a laughing stock: but my sorrow was of short duration, as my mother informed me that the queen had just killed one of the drones. I at once became excited and ran into the house, and to my joy and surprise found a drone "stone dead," and evident signs of fertilization visible on the abdomen of the queen. I removed her at once to a nucleus box, introduced her,

and in three days she laid eggs and has done well. I sold her for ten dollars. I tried two others, four days old, the next day, but failed entirely. Those were perfect queens, and could fly. I tried them on the fifth and sixth days after hatching, but did not succeed. I then left them to fly according to their instincts, to meet the drones in the air. This they both did on the eighth day. By this you see I was successful with two queens, and failed with two. Not being discouraged, I resolved to change the programme, for I discovered that the drones and queens wearied themselves, and soon became exhausted. To remedy this evil I cut a large hole in one of my honey boards, so as to admit a large lamp chimney. I then placed wire cloth on top of the frames some six or eight inches square, and set the lamp chimney level on the wire cloth, inserting the glass chimney through the hole cut in the honey board. I then watched for some of my young queens to make their appearance, and as soon as I discovered one I caught her and ten or twelve drones, dropped them into the top of the chimney, and corked it with paper, and the first trial the queen mated in less than one hour with one of the drones. I removed her and cut off one of her wings so that I could not be deceived. The next trial I failed entirely, for reasons I cannot assign. I have tried the tumbler and glass chimney very often since, and succeeded about half of the time. I succeeded in one instance where a queen had hatched without wings, having small knots where the wings should have been. This I accomplished with the tumbler, as first related. This queen was clumsy, and did not become very prolific, and I lost her in introducing her to strange bees, but reared some extra queens from her brood. I have tried Mrs. Tupper's process, as she described it to me, and was successful to a reasonable extent.

"One point more and I have done, for this time, and that is, that I have seen young queens that had mated three or four times with different drones, but notwithstanding I am satisfied that such queens have really been impregnated only with the last drone. My reasons for believing so are founded on facts obtained by close observation. First, I never saw a queen yet that mated with more than one drone in the tumbler, the glass chimney, or by the process described by Mrs. Tupper. I think I have discovered the cause why young queens fail to become fertile. After meeting the drones they always return to the hive with the genital organs adhering to them, and if caught immediately and confined over night, they almost invariably prove to be fertile. I caged over forty queens this summer, for this purpose, and not one of them left the hive the second time in search of the drones. Of this I am sure, for I clipped their wings. By caging the queens as soon as they return, you prevent the workers from detaching the organs of generation adhering to them. I have

found that to remove this immediately will usually prevent impregnation. I have removed it from some queens three or four times this season, and thus prevented impregnation. Every observing apiarian, if this subject ever attracted his attention, knows that the workers will remove this foreign substance from their queen, and it is common in a short time to see one of them coming out with it. This untimely removal, in my weak judgment, is the true cause of such queens mating with different drones—my experiments, at least, go far to establish this fact; and if my experiments prove this point, the theory that queens are often fertilized with several drones is erroneous, and this cannot be the reason why the progeny of a pure Italian queen contains some workers purely Italian, whilst others are as purely the common black bee."

The difference between Mrs. Tupper's method and the one described above is very slight—only a difference in the manipulation—the principle being the same. Mrs. Tupper confined the queen, five days after she issued from the cell, in a wire cage with the selected drones. The cage was then laid on the frames of the hive, and covered over and left there for 36, and in some cases 48 hours. The cage was about six inches square by eight inches long. Mrs. Tupper claims that in such a cage the queens were fertilized, though she admits that last year she had several failures, I also learn through private correspondence that J. E. Ponet tried a similar process last year, and believe he succeeded in getting several queens fertilized by selected drones. Rev. Mr. Truesdell, of Warwick, P. Q., was also experimenting last year, testing the process given by Mrs. Tupper. How he succeeded I have not yet learned. I hope he will give the results of his experiments in your journal for the benefit of your readers.

I fully intended to test the process last year, and did make one trial, in which I failed, but was prevented from giving it any further attention. I still have my doubts whether any queens have ever been fertilized in confinement. It is so contrary to their nature and habits that I should feel half inclined to doubt my own eyes if I saw it.

It has been already stated, and is a well known fact, that it is the natural habit of the queens to mate with the drones on the wing, and in no other way, if left to themselves. I am therefore inclined to receive with caution any statements that they have been fertilized in confinement. I have long thought that some process would be discovered whereby impregnation would be in a measure under the control of the apiarian, but cannot readily believe in a process so at variance with their natural habits. In corresponding with J. E. Pond, of Roxboro, Massachusetts, who fully believed that he had succeeded in getting several queens fertilized artificially in confinement, he admitted that he was, to use his own

words, "dead sure in only one case." Mr. Freeman Moore, in giving the results of his experiments which appeared in my last, states some things which are a little hazy, and cast a shadow of doubt over all. He does not believe the statement made by his friend Henry Atherton, that the queen stung the drone to death, but thinks that Mr. Atherton saw the queen impregnated by the drone, for he says a queen will not use her sting except on a rival queen. In this he is mistaken, for a queen will sometimes, when confined in a tumbler, sting to death a worker bee if introduced into the tumbler with her. Hence there is no reason to doubt that, in some cases, she would sting a drone to death if introduced to her, and it is altogether probable that Mr. Atherton was quite correct in saying that the drone was stung to death. I believe, however, it is not generally known that a queen will sometimes, when confined, sting other bees, as well as rival queens. Again, he says, "my mother informed me that the queen had just killed one of the drones, and to my joy and surprise I found a drone 'stone dead,' and evident signs of fertilization visible on the abdomen of the queen." Now, the drone does not die instantly after coition; therefore in that he was mistaken, and he may have been mistaken in thinking that the queen was fertilized. True, he says he removed her to a nucleus box, and in three days she laid eggs and did well. But she may have left the nucleus box on the first day after introduction, and mated with a drone on the wing. Indeed, it seems more reasonable to suppose that she did so, as a queen generally lays in 48 hours after impregnation, and 48 hours after the first day she commenced to lay, which would make it just three days after he introduced her into the nucleus box, at which time he said she commenced to lay. I fear the experiments have not been carefully conducted, and that after all it may turn out that the queens were fertilized in the usual manner. On the other hand, one can hardly believe that Mrs. Tupper and others have been mistaken in every instance. Doubtless, it will, this season, be settled beyond dispute.

I have already stated that, when coition takes place, the organ of the drone is left attached to the body of the queen. If, then, a queen is confined with drones, and during this confinement the organ of the drone is found attached to the body of the queen, the question is settled. Those who may desire to experiment will remember that the queen goes out to meet the drones from five to eight days after issuing from the cell, and the proper time to confine her with the drones will be during that time. It will also be absolutely necessary to keep the queen confined in the hive until the proper time, lest she go out earlier than usual. I would advise keeping her in the hive until the eighth day, and then introduce her to the drones.

FURTHER EVIDENCE OF THE SUCCESS OF MRS. TUPPER'S PROCESS.

Since writing the foregoing article, I have received additional evidence of the success of Mrs. Tupper's method. Some time in early spring, last year, A. Malone, Esq., of Garden Island, wrote to me to know if I had yet published Mrs. Tupper's process, as he had not seen it. I wrote to him, describing the process, but not knowing how he had succeeded with it, I made enquiries of him by letter a short time since, and I subjoin his reply. It is quite satisfactory. I hope Mr. Malone will give us notes of his success the coming season. I do not think it at all necessary to remove the queen from the stock on which the cages containing the drones and queen to be fertilized is placed. By removing the honey board, three cages could be placed on the top of one of my hives at the same time. Let others try it and report.

J. H. T.

"J. H. THOMAS, Esq. Brooklin, Ont

"DEAR SIR,—Your favour of the 14th inst., asking for information relative to the fertilization of queens by Mrs. Tupper's process, is before me, and in reply I would beg to say that I had queens fertilized in that way several times last season. I commenced early in the spring to try and raise a number of colonies from one, as described by Mr. Tallup. (I think in the January number of the *Bee Journal* for 1868), and having lost every queen I raised by letting them fly out for fertilization, I at last tried Mrs. Tupper's plan, and succeeded. I first made some small Nuclei hives, and inserted three frames in each (with brood and comb in them), and placed a queen cell in each in such a manner that by turning a button I could see the cell. As soon as the queen was hatched I caught her and placed her in a cage made six inches square by eight inches long, two sides of the cage being wood, the rest wire, and placed a good number of worker bees in with her, and put the cage on top of the frames in one of your hives containing a good swarm of bees, having first removed their queen. When the queen was five days old, that is, on the fifth day, I took out all the worker bees, and placed seven nice large drones in with the queen. I have a door in one of the wooden sides of my cages, which makes it handy to put in, and also to catch the queens. I left the queen and drones together forty-eight hours in the cage, having placed them back again on top of the frames, and replaced the cover and plugged up the ventilators which are in the sides of the cover, to keep out the light. Of course I put some honey in the cage, out of the reach of the bees below in the hive, to keep the queen and drones from starving. Each time on examination, I found (with one exception) a dead drone, having all the end of his abdomen burst open, and twice I noticed evidences of copulation on the queens. To make myself doubly sure that they were fertilized by this method, I introduced the queens into new swarms, and closed the slide, so that nothing but a worker bee could go in and out, and all the queens, (with one exception, as mentioned above) in a few days commenced laying, and reared nicely marked Italian workers. The reason those that flew out for fertilization were lost is, I think, that on account of my living on an island, and having very few drones, the queens attempted to cross the river and were lost.

"Yours, etc.

"A. MALONE."

Household.

Dry Cellars and Door yards.

In building a house, few people think as they ought of the future, or that in all probability their lives will be spent in it. A farmer when commencing to build a farmhouse, usually begins by putting some temporary kind of foundation under it, oftentimes only of block, the refuse of the framing timber used.

If a cellar is dug, it is often a mere hole in the centre, with the earth thrown out on one side, there to remain an unsightly heap or heaps, as the case may be, until nature covers the abomination with grass or weeds, thereby hiding somewhat its untidy appearance.

Moreover, houses are almost all built in dry weather, and often a level place is from necessity selected as the site. When wet weather comes on in the fall, there is no possibility of moving out of doors for the mother and children, without splashing through the mud that always accumulates around any frequented building. Dirt, filth, and wretched appearances are the result, instead of a clean, comfortable dwelling. Every man who enters the dwelling brings in bootloads of mud and mire to be distributed through the house; and no wife's temper can be expected to bear this unnecessary annoyance. Recollect, too, this misery usually lasts a lifetime. The remedy after the house is built is very difficult; but is easily provided if thought of at the outset. I have seen hundreds of such muddy door-yards; in fact, to find one ordinary farmer's house *without* such a muddy mess all around it in wet weather, is the exception, and not, as it ought to be, the rule. Now, all this is most readily avoided by a small outlay of labour and foresight at first as will be seen by following the accompanying suggestions. I will venture to say the outlay will be amply repaid the first and second year in the increased profit of a dry comfortable door-yard, and raised terrace or frost-proof round the house, and an excellent frost-proof cellar under it.

Let us now commence to lay out our foundation, and suppose we are going to build a frame house of about thirty by twenty, or any other size that may suit the means of the builder.

I would by all means advise those who can afford it to build large enough at first, and those to whom it would be too expensive to do so, ought to calculate so to arrange the small house they build, that in future they can add a portion to it, as their family increases, or means to build more extensively are gained. To this class of builders, who must in the outset limit their accommodation, I would urge that it is always better to so arrange the house, that the passage way passes along one (say the west) side of the house, thus building the present house on one side of it; so that in future any additions can be readily put to the west side of it, without in-

terfering with the architectural appearance of the building, leaving of course the necessary projections to attach the addition to at some future period. This foresight also allows of the first house so made to answer as a kitchen and offices, and the new addition, when completed, to be used as a parlour and a better and more convenient class of rooms.

As I before said, we will now proceed to stake out our foundation, say as above, twenty by thirty, and as an absolute necessity also to dig a cellar *under the whole house*. The excavation may be deeper or otherwise according to circumstances of drainage; but we will suppose, as is most commonly the case, that the house must be built on a comparatively level place, with only about four feet drainage fall at the lowest. The surface earth that comes out first must all be put away towards the front, but distributed in small heaps, and at such a distance only as will enable it hereafter to be thrown back to enrich the surface of the front.

The excavation of a cellar of four feet deep will, of course, cover an area around the house four times as great if spread over it one foot deep. A terrace would then be formed, raised one foot all round the house, and extending nearly twenty feet in all directions. Now, having thrown back to the front or sides of the raised part all the surface earth, it can afterwards be spread evenly on that portion to be used as a flower garden, or better still, as a lawn. On this raised portion, Mamma or the children can at all times and seasons move about in cleanliness and comfort; and, moreover, it forms a most ornamental addition to the house, as the edges must be all trimmed straight, and laid at an angle of about thirty degrees, and sodded over so as to prevent foundering. It is not a long or troublesome job to sod over the whole plat or terrace; about two days' work of two men and a team will cut and haul all the sod requisite, provided a plough of the wide share construction is used to cut the turf, and about two days more will lay it down, and finish it completely. The turf must not be cut thicker than two inches, or it will be troublesome and heavy to haul. Before the sods are laid, the land must be all perfectly level and smooth, and the turf when complete must be patted, or rolled level and smooth. An ordinary pavior's rammer is an excellent thing to level turf with, and can be made in half an hour.

Our cellar being now dug, and terrace made, we next proceed to form our cellar walls. The best course for a farmer to adopt is to erect round cedar posts, of say about seven or eight inches in diameter, and nicely barked, or carefully squared up, the lower end sunk about one foot into the cellar floor, and the upper end morticed into the sill above, which rests on these posts, which should not be more than six feet apart. Stretchers, four by four, must be let into the posts at the back; one at the bottom, about six inches up; one at about two and a half

feet, and one at about five feet from the ground. Less in number than these will not support the earth, without danger of bulging in, and thus looking unsightly. At the top a fillet or batten is nailed to the under side of the sill, about two inches from its face. Now you must take two ply of inch boards (rough edge cedar is infinitely the best) and stand up all around, the outer ply breaking joint with the inner. They must be squarely and carefully cut off at the top to fit tightly against the fillet or batten, and yet to fit up close under the sill. Square edged cedar is difficult to be obtained; but rough edged can be had anywhere that sound logs can be got to a saw mill. It is much cheaper and better, as well as more durable, than any other lining that can be used: pine will decay directly. After all the boards are carefully put in their places, the earth is to be filled in, and the water table fastened against the sill. To protect the sill from decay the water table should be nailed to inch strips fixed upright on the sill at every two feet all round the building. This space between the sill and water table will defend, for many years, the sill from decay. Immediately under this, another cedar board is to be nailed on, still leaving the space. This board will allow of the earth lying close against it, but yet leave one inch behind and between it and the sill, to prevent decay; and this arrangement also admits of fresh air after years without disarranging the main portions of the cellar lining. The careful foresight thus so cheaply used will cause the wooden foundations of a house to remain sound for thirty years or more; and without it the sill would show signs of decay in five years. Of course all rain must be directed by spouts away from the foundations, if the cellar walls are to be kept dry and in good order.

A drain must be dug, if possible, but in some localities this cannot be done; and where all surface water is kept from running into the cellar, and there is no absolute spring, a very good substitute may be made by digging a well about four to six feet below the bottom of the cellar, but outside the house and close to it, with a communication from the bottom of the cellar floor by a drain. A pump in this well will, at all times, enable you to free the cellar from water in half an hour; and as this would not probably be required except in exceedingly wet weather the labour would be little.

It is quite clear a cellar must be had, and if the circumstances are not worse than described above, either remedy of drain or pump will be found to answer. We must have both cellar and earth to raise round the house, and this is far the cheapest way to obtain it. What is the extra expense entailed by doing this? The contents of the cellar will be about ninety or one hundred cubic yards, and can generally be excavated for ten or twelve cents a yard. To do otherwise than here described, on the score of saving of expense, is very poor economy. With such a good cellar the butter of ten cows will, from its

better quality alone, pay all the expenses in two seasons, if not in one. Consider what an advantage it is to have such an excellent cellar, with everything cool and sweet in the summer, and free from frost in winter. Any root cellar, for house purposes alone, ought to be built just the same, but detached from the house, under some shed or other building to keep off the rain; it can be made to communicate with the cellar by a door. The roots, potatoes or turnips can be got into the root house through a trap in the upper part, and thence into the cellar for use by the door of communication. A small ice-house about six feet square, also with a door of communication with the cellar, would be an exquisite luxury, and cost hardly anything to build. Full particulars for building such an ice-house, as it exists attached to my cellar, will be given in some future number. C.

Earth Closets.

The only positive requisite is the dry earth or dust. A supply is easily shoveled up from the roads in August or September, but if none was secured, and if artificial drying is inconvenient, if none can be scraped up from sheds, the siftings of coal ashes answer very well, better as a friable divisor than the earth, facilitating the intermixture of the manure with the soil to which it is applied, but perhaps not quite so effectual in retaining all its good qualities. But these will not escape if the ashes are used in sufficient abundance to absorb all the liquid without becoming saturated with it. A common tinful of this very dry ashes or dust poured after every use of the seat, will effectually prevent everything offensive to either sight or smell. It is best received on the ground, as if any wooden receptacle is used it will absorb some of the liquids, and as the dust cannot follow them into the wood, the latter will soon become offensive. And it is more convenient to shovel the harmless compost off the surface of the soil than to lift it out in a wooden box. I have seen plans of self-working seats much simpler than those of Mr. Moule, but it seems scarcely worth while to take the space necessary to describe them, when an old tin cup answers perfectly and conveniently.—*Country Gentleman.*

A Working Dress for Farmers' Wives and Daughters.

To the Editor.

SIR,—I trust my fair friends will pardon me if I draw attention through your journal to a matter of domestic interest, which I think deserves more notice than is usually accorded it—namely, the every-day dress of our farmers' wives and daughters. Many of our farmers' daughters are trying to follow city fashions regarding dress, to an extent beyond what is advisable for their own good, or the comfort of others. How often does it occur when they (the girls) are called upon during

the forenoon, or while engaged in house work during the after part of the day, that visitors are kept waiting for an unpardonable length of time in some gloomy-looking room into which they have been ushered, though the callers may only have some trifling business which would take but a few minutes to attend to; yet the parties must wait, no matter what haste they may be in. When the girls do come, they are dressed to perfection, and certainly it would be cruel then for the callers to leave immediately after they did their little errand, considering the time and trouble which it has taken to make the girls "fit to be seen."

Now, Sir, do you not think so much dressing is needless for farmers' daughters just for receiving callers. To be sure, many girls are not "fit to be seen" in the dress in which they do their house work; it is so dirty and ragged, and worn so slovenly, that it is no wonder that they are ashamed if thus caught. But might not a dress be devised which would be both neat in appearance and convenient for working, in which the girls could perform their household duties and receive callers during the forenoon. Perhaps the girls are ashamed of being caught at work, hence do not like to be seen in their working dress; but they have no more reason to be ashamed of work or their dress than farmers' sons; and the boys hardly ever run and hide in the stable or barns when a lady appears in sight, but generally are glad to meet them, though it be in their working dress. The mechanic does not feel ashamed if met in his working clothes by a young lady; nor does the plough-boy apologise for his dress if caught by half a dozen ladies. I like to see the ladies dressed neatly; but why dress in such extremes, sometimes in dirt and rags, then in silks and satins? Again, so much precious time is lost both to the callers and the called, while very often it is a great inconvenience to both parties, but more especially to the callers. I hope the hint will be taken, as it is meant, in good part, and trust that some abler correspondent, perhaps of the other sex, will take up the subject.

York.

CULTIVATEUR.

A young Portland woman, recently married received from a gentleman friend a large corn broom as a wedding present, accompanying which was the following piece of poetry:

"This trifling gift accept from me;
Its use I'd recommend,
In sunshine use the brushy part,
In storms the other end."

A very fine dressing for the hair may be made by mixing good pure glycerine with rosewater, one part of the former to three of the latter. Another has been found to make the hair soft and moist, and to retain these properties for some time. This consists of the white of eggs mixed with equal parts of alcohol, or used without the alcohol. After applying it the hair should be thoroughly washed with warm water.

PROTECTION OF WOOD FROM FIRE.—Wood-work is protected from fire by being painted with a mixture consisting of 5 parts of alum, 7 parts of rye-meal paste, and 30 parts of previously washed, *i. e.*, finely divided clay. This mixture is used for woodwork not exposed to the open air. For woodwork so exposed, a mixture is used consisting of 2½ parts of crystallized sal ammoniac, 1 part of white vitriol (commercial sulphate of zinc), 2 parts of joiners' glue, 20 parts of zinc white, and 30 parts of water. These mixtures have been found to prevent wood bursting into flame on ignition, and to greatly delay its destruction even when severe fires are raging.

Poetry.

WHICH?

"Which shall it be; which shall it be?"
I looked at John—John looked at me,
(Dear patient John who loves me yet,
As well as though my locks were jet,)
And when I found that I must speak,
My voice seemed strangely low and weak;
"Tell me again what Robert said!"
And then I listening bent my head.
"This is his letter:

"I will give
A house and land while you shall live,
If, in return, from out your seven,
One child to me for aye is given."
I looked at John's old garments worn,
I thought of all that John had borne,
Of poverty, and work and care,
Which I, though willing, could not share;
I thought of seven mouths to feed,
Of seven little children's need,
And then of this:

"Come, John," said I,
"We'll choose among them as they lie
Asleep;" so walking hand in hand,
Dear John and I surveyed our band.
First to the cradle lightly stepped,
Where Lillian, the baby, slept,
A glory 'gainst the pillow white;
Eerily the father stooped to lay
His rough hand down in a loving way,
When dream or whisper made her stir,
And huskily he said, "Not her—not her."
We stooped beside the trundle bed,
And one long ray of lamplight shed
Athwart the boyish faces there,
In sleep so pitiful and fair!
I saw on Jamie's rough, red cheek
A tear undried Ere John could speak,
"He's tut a baby yet," said I,
And kissed him as we hurried by,
Pete, patient Robbie's angel face,
Still in his sleep, bore suffering's trace;
"No, for a thousand crowns, not him."
He whispered, while our eyes were dim,
Poor Dick! bad Dick! our wayward son,
Turbulent, restless, idle one—
Could he be spared! "Nay, he who gave,
Bid us befriend him to the grave:
Only a mother's heart can be
Patient enough for such as he.
And so," said John, "I would not dare
To send him from her bedside prayer."
Then stole we softly up above,
And knelt by Mary, child of love,
"Perhaps for her 'twould better be,"
I said to John. Quite silently
He lifted up a curl that lay
Across her cheek in willful way,
And shook his head. "Nay, love, not thee."
The while my heart beat audibly.
Only one more, our eldest lad,
Trusty and truthful, good and glad—
So like his father. "No, John, no—
I cannot, will not, let him go."
And so we wrote in courteous way,
We could not drive one child away;
And afterward toil lighter seemed,
Thinking of that of which we dreamed,
Happy in that not one dear face
We missed from its accustomed place;
Thankful to work for all the seven,
Trusting the rest to One in Heaven!

Agricultural Intelligence.

Double-furrow Plough Competition.

The following account, taken from the *Edinburgh Scotsman*, of a trial of double-furrow ploughs near Dalkeith, Scotland, will be interesting to our readers from the fact of the implement being regarded as originally a Canadian invention:—

A double-furrow plough competition, under the auspices of the Dalkeith Agricultural Society, took place recently on the farm of Wester Cowden, near Dalkeith. Double furrow plough trials have become so common of late that agriculturists are apt to forget that such implements were introduced to their notice many years ago. Apart altogether from the original Somerville plough of this description, a double and triple furrow agricultural implement of a form allied to that now in use, was brought under the attention of farmers in the United Kingdom in 1862 by Mr. Sovereign, who came over from Canada for the purpose of introducing it, but on account of want of patronage was compelled, after expending both time and money, to retire to his native wilds in the Far West. Since then, local inventors have been endeavouring to improve on the Canadian invention. Within the past few years agriculturists in Scotland have recognized the immense value of the double-furrow plough, and among the many inventions which are considered improvements on the original implement, considerable doubt has existed as to which would prove the best over all the different qualities of land. With this view competitions have been held all over the country, and it may reasonably be held that that which has taken the majority of prizes maintains the precedence over the others. It has been said that a plough may make better work on stiff land, and yet be far behind others on light, easily-wrought ground, or *vice versa*; but the implement which can secure the approbation of agriculturists on both varieties of land may well be looked upon as the champion plough. In order to decide this point, the Dalkeith Agricultural Society recently offered prizes for the best double-furrow plough, and the result was an interesting competition. Out of the seventeen ploughs which were entered, thirteen came forward to try conclusions. The ploughs were first tried on a lea field composed of stiff clay, and after ploughing their allotted space they were taken to stubble ground which had been manured, on which the capabilities of the different ploughs were fully tested.

The following are the results of the trials as tested by the dynamometer, under the hands of Mr. Slight, practical engineer to the Highland and Agricultural Society. Messrs. Gray & Co.'s, Uddingstone, G. B., 6 cwt.; second trial, 5 cwt. This trial was particularly interesting, inasmuch as Gray's plough was

tested by the dynamometer with high-crested irons, which drew 6 cwt. At the request of the judges, the plough was tried with plain or obtuse cutting irons, and the draught of the plough with these irons was only 5 cwt., or exactly the same draught as that exhibited by a single-furrow plough made by Ponton, which was tried over the same land, drawn by two horses.

LEA—1st. Messrs. J. Gray & Co's, 5 cwt.; 2nd, Wm. Shiras', Aberdeen, 7½; 3rd, Mr. Mitchell, D.F.C. Peterhead, 7. Commended, Mr. Pirie's, Keith, 6½; Mr. Murray, H.G.L.M., Banff, 7; Mr. Murray, H.D.M.R., 8½; Mr. Mitchell, D.F.F., 7; Mr. Guthrie, Montrose, 6½; J. Gray & Co., G.A., 7½; Mr. Anderson, Monifieth, 8½ to 9; Wm. Kirkwood, Lothian Bridge, 9; Mr. Guthrie, 6½.

STUBBLE—J. Gray & Co., G.B., 6½ cwt.; Mr. Murray, Banff, 7.

It will be seen from the above that Messrs. Gray received the first prize of £5, and on the lea their plough was, with the square bottom, of as light draught as that shown by one of Ponton's swing ploughs, namely, 5 cwt. Only two ploughs were tried on the stubble, Gray's and Murray's, and the former had the advantage of half a hundred weight; but on account of the prize winner going half an inch or more deeper, the draught, according to the dynamometer, was 2½ cwt. more than the single plough.

Manufacture of Beet Sugar.

We learn by the *Berlin Telegraph* that on the 24th of February a meeting was held in the town of Norwich, County of Oxford, for the purpose of hearing the report of Mr. D. S. Butterfield, who had been delegated by a number of influential men from Oxford, to Fond du Lac, Wisconsin, to examine the Beet Root Sugar manufactory at that place.

The report Mr. Butterfield gave was explicit and interesting, including the exact *modus operandi* in the factory, a statement of its capacity, number of working hands, a minute description of machinery, and the amount of capital invested.

He had brought two samples of beet root sugar with him, the one a half refined white, the other a very bright crystal coffee sugar, both grades in colour as well as in taste, equal to any manufactured from the cane juice. The proprietors of the factory at Fond du Lac (an American and two Germans, the latter experienced in this branch of industry), had invested \$16,000, partly in the machinery, which they valued at \$12,000 (exclusive of the steam engine, which, together with the building and premises, they had rented), and partly in procuring the beet, of which they raised about eighty acres themselves. It being the first year they manufactured, and not having worked up their full stock of beet root yet, they were not able to give him an accurate idea of the amount of profit made, but were confident that this would not fall short of \$3,000, clear of all expenses. Mr

Butterfield had taken some beet roots that were raised in the vicinity of Norwich to Fond du Lac, and in getting them tested by one of the experts in the factory, it was found that they contained an equal quantity of saccharine matter (namely, 7 per cent.) to those raised in Wisconsin.

Mr. Wm. Oelschlager, who had been invited to attend the meeting, was then called upon to give an address on this subject. His experience being derived from factories of the old country, which are all conducted on a larger scale than those in the United States, his remarks were confined to the former. He gave first a short description of the manner in which the beet seed is raised, then how the beet itself, adding to this some statistics showing the direct as well as indirect profits to the farmer in raising beet, in preference to the continual growing of cereal crops. He then described the interior and working of a large factory, illustrating this description by sketches of the different machinery. He concluded by giving some statistics showing how much money was sent annually out of Canada for sugar; for instance, in the year 1860, \$1,600,000, which might be kept in the country if factories of this kind were started here, and pointing out the benefit the country would derive, irrespective of this, by the increase of labouring hands required for these factories.

After a great many questions had been put to both the gentlemen, and satisfactorily answered, it was proposed, seconded, and without dissent resolved, that a company should be organized, with a capital of \$12,000, with power to increase: and Messrs. Moore, Barr, and Butterfield nominated as a committee to get subscribers.

A vote of thanks having been tendered to Messrs. Oelschlager and Butterfield for the efficient report and instruction they had given, the meeting dissolved after nearly four hours' sitting, with the fullest confidence that they will succeed in raising the required capital in a short time.

The directors of the Saranac Valley Beet Sugar Association have determined to enter largely this year into the cultivation of sugar beets, and the manufacture of sugar therefrom.

English papers are agitating anew the long-vexed question of the Game Laws, and it is stated that a decided effort is about to be made to call public attention to them, with a view to their total repeal. For this purpose a meeting was held in Birmingham on the 3rd of March, when the formation of a Game Law Repeal Association was set on foot.

The Northwestern Flax Association held its first annual meeting at Cleveland, Ohio, on January 26th. A memorial to Congress was prepared, stating that over five hundred thousand acres of flax are grown for the seed in the States of Ohio, Indiana, Illinois, Wisconsin, Iowa and Minnesota, and praying for the continuation of the present duty on gunny cloth.

Miscellaneous.

Pet Toads.

FOR THE YOUNG FOLKS.

I had four little girls all very fond of pets of any kind, rabbits, kittens, dogs, birds,—nothing came amiss to them to fuddle and pet. One day, whilst moving some old currant trees, we unearthed four large toads; fine fellows they were, with beautiful golden eyes. Each little girl at once pounced on a toad, and claimed it for her own; and forthwith they conveyed all four away to a snug house made out of a condemned soap box. A pet is nothing unless it will eat at almost any time. Every child knows this, and the great delight is to feed them to repletion, and the pet toads were not to be an exception to this general rule. When I came into the house from the garden in answer to the dinner bell, I found much apparent distress amongst the young folks because the toads would not eat. They had been tried with every green thing in the garden, but without success; eat they would not, and I was at once appealed to for assistance. I told the little ones to allow their pets to remain quiet until about sundown, and then we should see "what we should see." I promised them a treat. I was called away, and returned about eight o'clock in the evening. In the meantime, however, my brother had come home, and explained the habits of the toads.

I was greeted with shouts of "come and see, come and see, Papa." All four with short sticks, and every child clamouring and screaming with delight. The cause was soon apparent; each little girl darted away to an old pile of boards under the balcony, and shortly returned with a fine fat spider on the point of her stick. These spiders were regular fat, jolly fellows, and quite large. The stick, with spider on its end, was cautiously lowered to within about three or four inches of the toad's mouth. You might distinctly see the expression of its eyes—they were fixed for one moment on the spider, when, "Hey! Presto!" the tongue flew out directly from the mouth, and attached itself with inconceivable quickness to the spider, and as quick as thought the spider was transferred to the toad's throat and swallowed. Numbers of spiders and flies were thus disposed of, and it was really wonderful to see with what unerring aim the tongue was shot out, and the spider swallowed. Many young readers may not know that the toad is thus provided by nature with the means of procuring a living, the tongue being of that peculiar construction that at the will of the animal it can be shot out several inches. I really think some of the larger toads would catch a spider nearly four inches from his mouth.

These toads were then fed from day to day, and became quite tame, hopping about anywhere, and following the children for some yards when being fed. They were such fa-

vourites that they must, of course, have a name each; and as at that time the Grand Trunk Railway was just being built, the toads received the names of the four famous contractors, "Jackson," "Brassy," "Peto," and "Betts." As they were all just alike and of equal size, it became necessary or advisable to mark them; and accordingly each toad had tied round its leg a piece of coloured worsted. Each had a different colour, so that each child could identify her own. These toads were thus treated for several months; but as winter came on I saw the necessity of not interfering by domestication with their natural hibernating habits, and consequently removed them to a distant part of the garden, upwards of two hundred feet away. They were all wished "good bye;" I am not sure they were not absolutely kissed; I rather think that belonging to the youngest certainly was. Next morning they were all back again and in their house. They had climbed up, as they often had before, over the corner of the box, and all were snugly ensconced under the shelter provided for them. We removed them thus several nights following, each time farther away; and each morning they were back again and had climbed into their box. I then carried them still further, into a piece of wood at least four hundred feet away, and next morning all were missing but "Jackson." He had returned and was again in his box; but the rest never came back; and "Jackson," when carried away once more, gave up the idea, and remained where put, at the foot of an old beech tree, with splendid accommodation to be found amongst the roots for a winter habitation.

I had brought up my children to see the folly of the usual conduct of young ladies, in showing disgust, and even screaming, at the sight of any animal or insect. I recollect that one of my children (all girls at that time) was dreadfully afraid of rats; her's was genuine horror at even the sound of them. I caught one in an iron cage, and made a pet of it, and for weeks we used to feed it, to familiarize the child with the sight and sound of it. This had the desired effect, so far as the child was concerned; but the rat never made such a nice pet as the toad; it always squeaked lustily when approached too rapidly, and even to the last it never was quite fearless. We let it go free when the end of its captivity was answered, and what ultimately became of it I never knew. C.

CARE OF WAGGONS.—When you leave a waggon heavily loaded to stand a number of hours, put a support under the axletree. The strength of wood cannot be estimated by what it will support for a short time. It will bear up a third more weight for a few minutes than will be required to break it by continued pressure. Waggon are abused very generally, by overloading. If the axletrees do not break, they are sprung, and the wheels warped, which causes the vehicle to run hard, and shortens its existence.

It is said that many farmers in England intend to grow oats largely in place of wheat during the coming season, in consequence of the low price of the latter cereal.

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

WHETSTONES.—When first putting a new whetstone into use, try water upon it, and if this keep the surface from being glazed or burnished, oil will not be needed. Some stones work better with water than oil. A dry stone is very apt to give a wire edge. It has been said that a little carbolic acid added to water will increase the friction on either a whetstone or a grindstone.

Advertisements.

SHOW OF STALLIONS.

A PREMIUM OF \$250.

Open to any person in the Dominion.

THE show of Stallions for the North Riding of the County of Renfrew, will be held

AT BEACHBURGH.

On Saturday, the 7th May, 1870,

AT 12 O'CLOCK, NOON.

The North Renfrew Agricultural Society, at its meeting held on the 30th March last, passed a resolution giving a bonus of \$250 (of which sum Thomas Murray, Esq., M.P., liberally contributed \$50) for the best Draught Stallion, to stand for mares in the Townships of Westmeath, Ross and Pembroke, in the County of Renfrew, for the seasons of 1870 and 1871.

Any further information respecting the matter can be obtained from

N. W. JACKSON, Secretary.

Westmeath, April 1, 1870.

v2-4-1t

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Superior Southdown Sheep for Sale very cheap.

A SMALL flock having Jonas Webb's blood, comprised of seven ewes in lamb (some have lambed), three Yearling Ewes, and one Yearling Ram bred by Mr. Irving, of Newmarket. Price for the whole, \$115. Also an elegant Anglo-Saxon 3 year old Mare, price \$150. Apply (post-paid) or personally to J. WRIGHT, Wardsville. v2-4-1t

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Agricultural and Arts Association
OF ONTARIO.

The Twenty-fifth Provincial Exhibition will be held
at Toronto on the
3rd TO 7th OCTOBER NEXT.

Prize Lists and full particulars will be published in
due time
By order of the Council.

HUGH THOMPSON,
Secretary
v2421

Toronto, April 15, 1870

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I AM now prepared to furnish Eggs from First
Prize Imported Dark Brahmas, weigh-
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June, \$5 per doz., through July, August and Septem-
ber, \$3.

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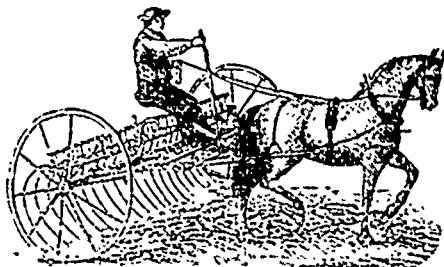
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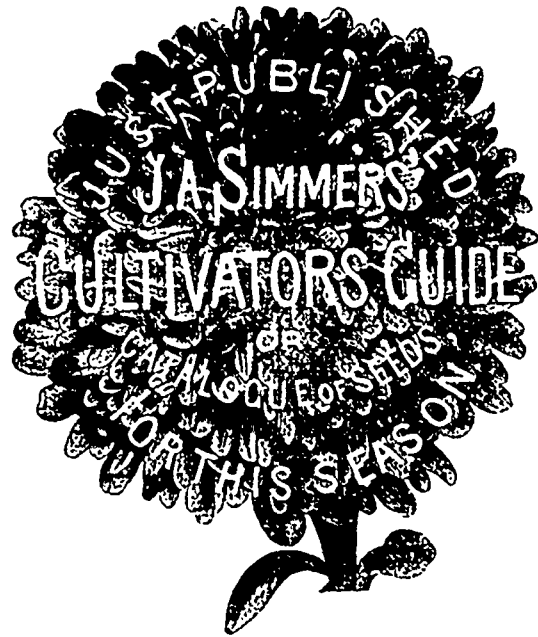
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N.B.—I have Wilson's Early and Kittatiny's, which
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At \$2 per dozen. The best varieties of last and former
years at \$1 per dozen. Prices by the hundred and
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N.B.—I have some 20 YOUNG SHORT-HORN BULLS, of recorded pedigree for sale. v2-4-3f.

TORONTO NURSERIES.
George Leslie & Sons, Proprietors.

WE ask the attention of purchasers to our full stock of

FRUIT TREES,

Of all kinds, SMALL FRUITS, bushes and plants, Ornamental, Deciduous and Evergreen Trees; Flowering Shrubs, Climbing, Moss and Perpetual Roses, 100 varieties best Dahlia Roots; Hedge Plants; Herbaceous Plants, &c., &c. The Stock is grown with a view to suitability to the climate of Canada.

Packing done in the best manner to insure safe carriage. Orders by post will receive same attention as if purchasers were personally present.

Priced Descriptive Catalogue, new edition, sent to applicants enclosing a two cent stamp for postage. Address all orders and letters of enquiry, post paid, to GEO. LESLIE & SONS, Leslie P. O., Ont.

N. B.—A splendid stock of Bedding Plants very cheap. v2-3-3f.

TO FRUIT GROWERS.

FOR SALE, a valuable Farm of 50 acres, with large plantations of fruit. Good house and out-buildings, two miles from St. Catharines, in the midst of the finest fruit growing region in Canada.

For further particulars address P. O. Box 68 St. Catharines, or Box 1372 Toronto P. O. v2-3-2f.

BEDFORD, MARCH, 1870.

BUSINESS AGENCY.
FARM, ESTATE, OR GARDEN.

MR. T. HOWICK has the pleasure of introducing good Men to fulfill any duties in connection with the above. No one is recommended whose antecedents have not been thoroughly enquired into.

Mr. Howick has sent good and tried persons for various duties, to Canada, United States, the West Indies, &c.

Reference to Mr. A. WILDMAN, Portage du Fort, and other gentlemen.

Home—Colonial—Foreign.
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IMPROVE YOUR SEED.

Genuine Imported Hungarian Seed Grains.

THESE seeds are carefully selected and warranted to be as represented.

	per bush.	peck.	quart.
Wheat.....	\$1.00	\$2.00	\$1.00
Rye.....	3.50	1.75	1.00
Oats.....	5.00	2.00	1.00

SAVE YOUR SEED FROM VERMIN AND BIRDS.

LASSING'S PATENT IMPROVED MODE OF PREPARING SEEDS. This patent powder protects all kinds of seeds from vermin and birds, and fertilizes after planting, and costs \$2 per pound, which is sufficient for 2 bushels of Seed. State, County and Town rights for sale.

Sent by Express to all parts of the country on receipt of price. Send for circular containing valuable information to farmers.

AARON MASKER,

Perth, Amboy, N. J. v2-3-3f.

THOMAS' FIRST PRIZE BEE HIVES

ARE the best in the market. They have been awarded the first prize at every Provincial Fair for the last six years; also at the Michigan State Fair, and the Michigan Bee-keepers' Convention. Orders are received for these hives from England, the United States, and every part of the Dominion. A novel and improved entrance added this year. A perfect arrangement. Parties ordering these hives run no risk, as their reputation is well established. Beware of humbugs! Orders filled promptly. Send for circular.

J. H. THOMAS,
Brooklin, Ont.

N. B.—Parties residing in the County of Northumberland, will send their orders for hives to JOHN B. LEST, Esq., Baltimore, Ont., as he has purchased the right for that County.—J. H. T. v2-4-1f

DOMINION OF CANADA



EMIGRATION TO THE PROVINCE OF ONTARIO.

To Capitalists, Tenant Farmers, Agricultural Labourers, Mechanics, DAY LABOURERS, And all Parties desirous of Improving their Circumstances by Emigrating to a New Country.

THE attention of intending Emigrants is invited to the great advantages presented by the Province of Ontario. Persons living on the interest of their money can easily get eight per cent. on first class security

Tenant Farmers with Limited Capital

Can buy and stock a Freehold Estate with the money needed to carry on a small farm in Britain. Good cleared land, with a dwelling and good barn and out-houses upon it, can be purchased in desirable localities at from £4 to £10 Stg. per acre.

A FREE GRANT OF LAND (WITHOUT ANY CHARGE WHATSOEVER.)

Every Head of a family can obtain, on condition of settlement, a FREE GRANT of two hundred acres of land for himself, and one hundred acres additional for each member of his family, male or female, over eighteen years of age.

All Persons over 18 years of age can obtain a FREE GRANT OF 100 ACRES.

The Free Grants are protected by a Homestead Exemption Act, and are not liable to seizure for any debt incurred before the issue of the patent, or for twenty years after its issue. They are obtainable in easy access of the front settlements, and are supplied with regular postal communication.

Registers of the Labour Market

And of Improved Farms for sale. It kept at the Immigration Agencies in the Province, and arrangements are made for directing emigrants to those points where employment can be most readily obtained.

Persons desiring fuller information concerning the Province of Ontario, are invited to apply personally, or by letter, to the Canadian Government Emigration Agents in Europe, viz: Wm. Dixon, 11 Adam Street, Adelphi, London, W. C.; J. G. Moylan, Dublin; Charles Foy, Belfast; David Shaw, Glasgow, and E. Smays, Continental Agent at Antwerp

Also to the Emigration Agents in Canada, viz

John A. Donaldson, Toronto; R. H. Rae, Hamilton; Wm J. Wills, Ottawa; Jas. Macpherson, Kingston; I. Stafford, Quebec; J. J. Daley, Montreal; E. Gray, Halifax, Nova Scotia; Robert Shaver, St. John, and J. G. C. Layton, Miramichi, New Brunswick, from whom pamphlets issued under the authority of the Government of Ontario, containing full particulars as to the character and resources of, and the extent of living, wages, &c., in the Province, can be obtained.

JOHN CARLING,

Commissioner of Agriculture and Public Works for the Province of Ontario.

Department of Immigration, Toronto, October, 1869. v2-2-121.

Markets.

Toronto Markets.

"CANADA FARMER" Office, April 12th, 1870.

FLOUR AND MEAL.

There has been but little doing recently, holders appearing disposed to await an upward turn of prices with the opening of navigation. The latest quotations are:

Flour—Superfine \$3.75 to \$4.80. Spring Wheat, extra, \$3.55. Fancy \$3.90. Extra, \$4.20 to \$4.25. Oatmeal—\$4.

GRAIN AND SEED.

Grain of all kinds is affected by the prevailing inactivity in the produce market.

Wheat—Softs, 90c. to 93c.; Spring, 86c. to 87c. Midge Proof, 87c. to 88c.

Barley—48c. to 55c.

Oats—36c. to 37c.

Peas—60c. to 62c.

Rye—55c. to 56c.

Clover—\$7.75 to \$8.

Alsike—\$9 to \$9.50.

Timothy—\$4.50 to \$6.

Tares—\$1.75 to \$2.

Flax—\$2.25 to \$2.50.

Hungarian Grass—75c. to \$1.

HAY AND STRAW.

Hay in moderate supply, and selling at from \$7 to \$13.

Straw—Fair supply, at \$4 to \$6.

PROVISIONS.

Dressed Hogs—\$8.50 to \$8.75.

Butter 18c. to 26c.

Eggs—15c. to 18c.

Potatoes—40c. to 50c.

Grease 75c. to \$1

Turkeys \$1.75 to \$2

Chickens—per 100, 75c. to 90c.

CATTLE MARKET.

The supply of cattle has been deficient, in consequence partly of the state of the roads. The following are the prices, dressed weight.

Beef—From \$5 to \$5.75

Sheep—From \$3.50 to \$5.

Lambs—From \$2 to \$5.

Calves—From \$3 to \$12.

Hides—From 5c. to 8c.

Calfskins—From 10c. to 12c.

Sweepings Green, from \$1.15 to \$1.50 Dry, from 30c. to 50c.

Wool—From 25c. to 26c.

New York.—Flour—Heavy; receipts 6,000 bbls.; sales 9,000 bbls at \$4.50 to \$4.60 for Superfine State and Western; \$4.65 to \$5.30 for common to choice Extra State, \$4.60 to \$5.45 for common to choice Extra West ern Rye Flour, Quiet, at \$4.55 to \$4.60. Wheat, Dull and nominally unchanged, receipts 18,000 bush.; sale 7,000 bush Rye, quiet. Corn, Scarce, receipts 400 bush. sales 18,000 bush at \$1.07 for old mixed West ern. Barley, Quiet; receipts 600 bushels; sales 6,000 bush. prime Canada Western at \$1.05. Oats, firmer, receipts 3,000 bush.; sales 21,000 bush. at 56 1/2c. to 58 1/2c. for Western in store. Pork, steady at \$26.25 for new mess. Lard, firmer, at 14 1/2c. to 14 3/4c. for steam, and 15 1/2c. to 15 3/4c. for kettle rendered. Butter, quiet, at 1 1/2c. to 20c. for Ohio, and 20c. to 35c. for State. Cheese, firmer, at 15c. to 16c. for common to prime.

PROVINCIAL MARKETS.

Montreal Flour—Extra, \$4.60; Fancy \$4.40 to \$4.45. Superfine No 1 Canada Wheat, \$4.25 to \$4.40. No 2 Western, \$3.80 to \$4.55. Bag flour, 100 lbs., \$1.90 to \$2.10. Wheat, Canada fall, 97 1/2c. to 98c.; spring 97 1/2c. to \$1. Oats, per 32 lbs. 25c. to 30c. Barley, per 48 lbs. 45c. to 50c. Butter, dairy, 17c. to 18c. store packed, 14c. to 16c. Apples, per bag, 75c. to \$1; pears, \$7. Pork, Me, \$24.50 to \$25. Peas, 75c. to 77 1/2c.

Hamilton April 5.—Flour per cwt., \$2.37 to \$2.62 1/2; bran, 60c. to 75c.; clover seed, \$7 to \$7.25; eggs, 20c. to 22c.; butter, 23c. to 24c.; apples, per bag, 75c. to \$1; potatoes, per bag, 90c. to 60c., dressed hogs, \$8 to \$8.50

Ottawa, April 5.—Flour, extra, \$5.25; No. 1, \$4.75 to \$5; bags, fall, per 100 lbs., \$2.62 1/2; do. spring, \$2.50; oatmeal, per 200 lbs., \$4.50; rye, none; buckwheat flour, 100 lbs., \$1.75; butter, 20c. to 25c.; eggs, 15c.

Contents of this Number.

Table with columns for section names (THE FIELD, STOCK DEPARTMENT, VETERINARY DEPARTMENT, THE DAIRY, POULTRY YARD, ENTOMOLOGY, CORRESPONDENCE, EDITORIAL, HORTICULTURE, APIARY, HOUSEHOLD, POETRY, AGRICULTURAL INTELLIGENCE, MISCELLANEOUS) and corresponding page numbers.