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THE CANADA FARMER.

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The Field.

Barley.—Its Fluctuation in Price.

In late numbers of the CANADA FARMER, we have drawn attention to the advisability of growing more barley and less wheat, in view of the unremunerative price of the latter grain. The same idea seems also to have simultaneously struck the English and the United States agricultural press. As a matter of course, if the suggestion were followed, and all farmers abandoned wheat and took to barley-growing, barley would soon be given away to get rid of it. We do not advocate too great concentration on any one crop. The farmer who diversifies his farming most judiciously, is the one who has fewest bad years. Therefore, those who have not grown barley would do well to try it. And we repeat our conviction that, having in view the superior quality of the barley that can be grown in the Dominion, Canadian farmers generally will find it to their interest to go more largely into the growing of that cereal.

The great objection to barley-culture we have already stated, viz., that it is more of a speculation than is the growing of any other grain, from the fewness of the buyers and the alacrity with which they combine to retaliate on the sellers by bearing down prices when a short crop has run them up to fancy figures. The Hon. Mr. Geddes gives, in the *New York Tribune*, an instance of the tremendous difference that may occur in two consecutive years in the returns from barley-growing. Some years since, he raised a splendid crop of barley, and so did the whole country, but the preceding year had produced a small crop, and the brewers gave him \$2 a bushel for his nearly 50 bushels per acre. The next year he had hardly 30 bushels per acre, and other growers were generally alike short in their crops. The price paid for this small crop was only about 60 cents, and slow of sale at that. Notice the difference. One year he received nearly \$100 per acre for his barley crop, the next hardly \$18. The solution of all this is to be found in the fact that the brewers were short of barley when the former crop came in, and each of them moved early and sharply to procure a supply; the crop was much larger than they thought, and when the next year came with its short crop the brewers were cautious and well stocked, and made their own terms.

Canadian farmers, that is, those living in the districts famed for their superior barley, are less liable to be the victims of a glut than are our neighbors over the line. For of late years, there have grown up, on this continent, many breweries which pride themselves on the fancy brands of their ale and beer. These breweries will purchase the very best grain that can be obtained. The consequence is that even in a plentiful year, the A 1 grades will go off readily, while the inferior will not realize their cost.

We do not wish to be understood as prophesying heavy prices for the next crop of barley, or low prices for the next crop of wheat. There is nothing so uncertain as the price of grain a year ahead. Another grasshopper year in the West, which is far from improbable—a widespread drouth, from which even now some districts are suffering—a European war which people who ought to know say is imminent—or many other things might happen which would unhinge the most elaborate of calculations. Therefore, let each farmer act on his own judgment, and, if he succeeds, let him claim the credit.

SPRING RYE.—Will some reader of the CANADA FARMER, who has had experience with Spring Rye, give the result of it? And can it be bought in Canada?—S. E. T., *New Jersey*.

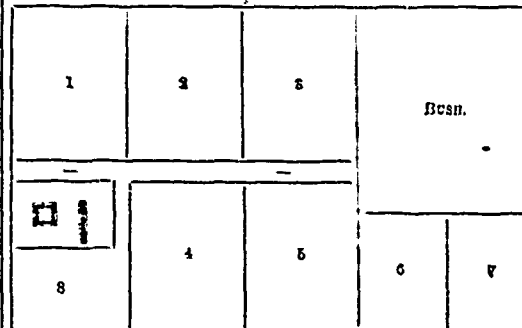
Laying out a Newly Cleared Farm.

EDITOR CANADA FARMER:—In the March number, "Farmer" wants help to lay out his farm. In the first place, I would suggest (if his buildings are not of a very substantial nature and if there is no particular reason for locating them in the corner) that they might be moved to a more central place, for if the buildings are not in the most convenient and best situation, one can not always work to advantage. When a settler starts on a farm, his shanty is put where the first spot is cleared, and, as buildings are increased, he gets attached to that spot, never thinking but that it is the best possible site that can be obtained.

When the buildings are in one corner, the farm can not be laid out so well, and there is more time lost in going to and from work, and as time is money, it would be to our interest to study its economy.

I would advise against having small fields, in as much as fences are a heavy item, as well as wanting the land that is occupied by them. Fifteen acre fields would answer such a farm as he describes, and an oblong field is better or handier than a square one in mowing or reaping. This will be evident to the most casual observer.

If "Farmer"'s buildings are located in the extreme corner and he is satisfied with them, a little alteration in No. 8 continuing the lane down to the buildings would



not materially change the plan. Nos. 1, 2, 3, 4 and 5 contains about fourteen and a half acres each. Nos. 6 and 7 contain about ten acres each but might answer in one field; and No. 8 after yards, garden and orchard is taken, may be about six or seven acres.

I append a plan which, if properly carried out, would make a farm appear to the best possible advantage, and, if put in the market, bring far more than it would if laid out in an unhandy manner.

Erin, Ont.

ZENAS.

"A Poor Farm."

EDITOR CANADA FARMER.—"It's a poor farm," remarked neighbor N., as he looked over the fence where I was engaged trying to prune some apple trees, which had become unshapely through neglect. "Yes," I replied, "it is a very poor farm, but don't you think it can be improved? Is it a little better than when I removed on to it, about two years ago?"

"Well, I can't see much difference," he said. This answer not satisfying me, I said, "Come with me, and you will see a change for the better, I think."

First, we went to the stable. "Now, you see here twelve good and comfortable stalls, for horses and cattle. Also, in one corner, a room partitioned off for a harness room."

"That is nothing extra," was the reply.

"Perhaps not," I said, "but if you had seen this stable when I first visited it, I think you could see the extras. At first sight, it appeared to have been used in connection with some racing establishment—intended for horses under-

going the 'freezing out' process, as horsemen call it. The floors were unsafe, and full of holes. The snow would drift in through the chinks in the walls, which, altogether, made the two dilapidated stalls rather uncomfortable. The rest of the building was unprotected, and having only a few cedar branches in lieu of flooring."

"What is that place in the corner?" he enquired, as we turned to leave.

"That is a place for the hens, during the winter. I did not wish you to see that, as I don't like the idea of keeping hens in a horse stable; but, considering the state of my buildings at present, I have no other alternative. However, as it is, between warm quarters and liberal feeding, we get a good supply of eggs almost all winter."

"You see that fence," I said, at the same time pointing to about 500 feet of a newly-painted picket fence, round the house and garden. "Candidly, neighbor N., is not that better than having your neighbors' cows in the doorway all summer?"

"It is rather a nice fence," he remarked; "who built it?" I told him the farm hands dug the post holes, and I built the fence myself, as I did the improvements done to the stable. "It is not my aim," I continued, "to expend large sums of money in costly buildings, with gilded weathercocks (even if I had it, which is not the case). Any person with sufficient means could do that, even if he could not tell a pick from a crowbar. If I can make the farm pay, then I will put up good buildings, (which I like to see), but the money to do it with must first be dug out of the soil."

"I see you have built some good houses for your farm hands; what did they cost you? Will they pay interest on the money invested?" A smile was perceptible on the face of Neighbor N., as he asked the latter question.

I said I thought it would pay better interest than any other investment on the farm; "and if you do not think it too much trouble to call, some wet day, or evening (when the work is not pushing), I will prove to you the correctness of my assertion. In the meantime, the men and horses are coming in for the noon-spell (the spell we like best). Good-bye."

FARMER.

How to Plough.

Mr. J. C. Mapes sends to the *Ohio Farmer* some concise and practical directions on the art of ploughing. He commences by giving definitions of the terms used. A furrow, he says, is the trench or channel made by the plough when it is drawn through the soil, and it is said to be wide, deep or shallow. The furrow slice is the strip of soil which the plough separates and turns away from the unploughed soil, when making a furrow; and it may be wide, or narrow—thick, or thin. A back furrow is two furrow slices turned toward each other, so that their edges will meet; or, one may over-lap, or lap on the other. A dead furrow, middle furrow, or open furrow, which are only different names for the same thing, is the channel that is left when a land is finished. When a subsoil plough is run in the furrow of a common plough, it is called subsoiling.

In ploughing some kinds of land, a certain make of ploughs will operate in the most satisfactory manner, while on different soils those very ploughs will not operate in a successful manner at all. Good ploughs for stubble ground and for cross ploughing, are, in many cases, almost worthless for ploughing heavy sod ground. Some ploughs operate well when they cut a furrow only four or five inches deep; but when they are put into the soil from seven to nine inches in depth, the draught becomes unaccountably hard, and it requires the strength of an able man to hold them; and even then they will not do the work well. Some are constructed with such an improper shape that an increased depth of the furrow of only one inch will so affect their operation, as to make them work decidedly bad. A plough that works well for ploughing deep, may cut a shallow fur-

row well; but a plough may cut a shallow furrow well, but will not cut a deep one so well, and turn it well.

The surest way is to purchase it on trial, for your manner of adjusting a plough and of ploughing, and your team, are all so different from some one else who pronounces the same kind of a plough the most perfect implement in the world, that you cannot by any possibility operate it in any satisfactory manner. If a plough which you do not desire to purchase. And as different ploughs are calculated for ploughing different kinds of soils, and for cutting a furrow of given depth, it is always better to purchase it on trial. In order to do good work, the skillful agriculturist will keep on hand different kinds of ploughs, adapted to all the several kinds of ploughing, and to the different kinds of soils. A good plough is one the shape of which is such, that the draft will be as light as possible, that it will turn a furrow-slice well, whether five or eight inches deep, and will maintain any form of furrow hold easy and glide along as smoothly as a goose on the water.

In striking out a land, the first furrow always requires much more strength of team to turn it than is required after one furrow has been turned. And the draft of a plough needs a different adjustment with the clevis, usually, to run at the same depth in striking out a ridge, and in ploughing after two or three furrows have been ploughed. Therefore, adjust the plough to cut a very shallow furrow, and go twice in one place for the first time round. In order to strike out a back furrow straight, plant not less than three stakes in a row, and if the distance is very great, there should be more than three. The beauty and excellence of ploughing are, to keep the furrows of uniform depth, and as straight as a line. He who cannot take a team alone, and strike out his land and finish them and adjust and re-adjust his plough to suit all circumstances, and perform a good job, cannot be a complete ploughman.

Every farmer knows that when a field is ploughed by going around it and turning the furrows outward, all the soil is thrown at each ploughing nearly a foot towards the outside of the field. And by this mode there is a strip of ploughed ground at each corner on which the team turns which is so trodden as to injure it very much, and in the middle there is always a dead-furrow, upon which little or nothing will grow. A far better way is to begin to plough in the middle of a field, and back-furrow the whole in one land. Ploughing a field by beginning in the middle is the neatest way in which a field can be ploughed. The only difficulty is to get started correctly. The first step is to find the middle. Then measure from the middle to the side of the field, then measure the same distance on the ends of the field to the middle and here start your plough, running a straight line to within the same distance from the opposite end; here turn to the right and make a back furrow. In this way plough the whole field, keeping the distance on the ends and sides equal, and the furrows perfectly straight and of uniform width. In order to have the field finished alike on all sides. By ploughing in this manner there will be neither ridges nor dead furrows; nor will any of the ground be trodden upon by the team in turning at the corners. A field can be ploughed in less time, and with greater ease, and will produce a better crop than when divided into several lands.

Cheap Barn.—Plan Wanted.

EDITOR CANADA FARMER.—I have recently become the owner of a farm of 100 acres, of which about 20 acres are bush. My barn is the most ill-contrived structure that I ever saw, and I want to abolish it. In building another, I should like, if possible, to get the benefit of the experience of some one who knows the difference between a good and a bad barn. I shall be able to get a basement by digging into a side-hill. I can not afford to lay out any more money than is quite necessary. I want a good-looking building, but do not wish to sacrifice looks to utility and cheapness. Will some brother-farmer give me their idea about it?

Lambton Co., Ont.

AGRICOLA.

Burning Charcoal

The value of charcoal as fuel or for other purposes around a country residence, is almost wholly ignored. Nevertheless once its value has been recognized and experienced, there are few persons who have the means of procuring a supply that will ever afterwards be without it. The very best kind of charcoal for a wood fire that can be had, are half charred brands from a coal pit. These take fire very quickly, and give out a great heat. Charcoal is an excellent fuel for summer time, and a few pieces burned in a water-burner made for the purpose, will heat water for domestic purposes with the greatest convenience, and without smoke, either with or without doors. For farm and household work it is superior. The only way to get the most of it is to have at least to have his blacksmith's forge in his tool house, where he may make a bolt, mend a chain, or repair any iron

work of his machinery in a few moments, saving both money and time, which is now more than money. To burn the coal is a very lazy business. Any wood may be used, but hard maple, beech and yellow birch make the best coal. Pine makes a soft coal that is much liked by blacksmiths, but the coal from soft woods burns quickly and leaves a very light ash. One cord of wood well burned will produce 40 bushels of coal.

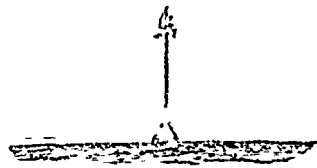


Fig. 1

To burn a pit, one must first clear off a hearth by leveling a space of ground 24 to 30 feet square, removing stones or other impediments. In the centre of the hearth a round, straight pole, (a small balsam fir or spruce, trimmed smoothly, is just the thing) is erected and set loosely in the ground. A quantity of dry kindling wood is heaped around it as shown in the accompanying sketch (Fig. 1). Around the pole the wood, cut three or four feet long, but all equal lengths, is arranged in a circular pile, standing on end in a gradually increased sloping direction, as seen at fig 2. Upon the first rank a second is placed, taking care as the wood is raked, to fill in all vacant places with small or split wood. A third rank is placed upon the second, and the heap is then trimmed smoothly by laying small wood or limbs until a conical pile is made with a surface as nearly smooth and even as possible. It will be obvious hereafter that much depends upon this smooth finish. The wood is then covered all over with a layer of leaves, raked up in the woods, or short litter from the stables, about six

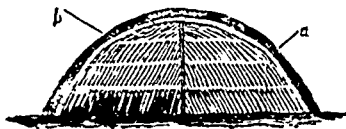


Fig. 2

inches thick. Pea straw is an excellent covering, but damp hard wood leaves will be found the best of all. This must be perfectly well done. Then a layer of fine loam free from stone, neither sand nor clay—the surface soil from newly cleared good land, with much vegetable matter in it is best—is laid compactly and evenly upon the leaves and smoothed off with the shovel. A long handled shovel is used for this work, and when large pits are made, a stage is used to throw the earth on first. The position of the layer of leaves is seen at fig. 2, a, and of the layer of earth at b; the dark line down the centre is the space left where the pole is drawn out after the covering is all done. The covering of earth of course is commenced at the bottom, and it generally follows closely on the covering of leaves—that is sufficient if the latter is kept a foot in advance of the former. When the pole is withdrawn, a shovelful of live coals of wood is thrown down the centre of the pit on to the kindling wood at the bottom, and when it is fairly on fire the central space is filled with long thin pieces of dry pine, and the top of the pit is by-and-by closed with leaves and earth like the rest. Air-holes are opened at the bottom in various places, to draw the fire to those parts that are not coaling rapidly enough, and these are carefully watched and closed when their purpose is served. The object is to keep a smouldering fire at a low heat, sufficient only to char the wood without burning it. If too great a heat is allowed in any part, there will be a lot of ashes there and no coal. This is soon learned by experience. As the pit burns down it shrinks; the covering falls in spots, and if it is not watched, it may burn away in a few hours. To provide for this, a supply of



Fig. 3

small cut wood and chips from the woods, with leaves, are kept on hand. Every morning and night the pit is dressed. The dressing consists in looking for these weak spots, removing the covering, filling the gaps with fresh wood and chips, beating these down with the shovel, and covering with fresh leaves and earth. The whole pit is thus gone over, and it gradually shrinks into the shape seen in fig. 3. After about 16 days the pit takes this shape. It is

“prodded” with an iron rod to find out where any uncoaled wood remains, and an air-hole is opened by thrusting the shovel handle into the pit at that place until the fire is drawn there, and the process of charring restored. Now is a critical time. The pit is kept compact and free from cavities by constant dressing; the completion of the coaling is hurried where it is slow, and where by trying it with the rod the coal is found to be sufficiently burned, the covering is made perfectly close and air tight. It depends on this how many brands are left, but generally the brands will be found as useful as the coal; and if the coal is not to be sold, it matters not if a larger proportion of brands than usual is made. When finished, the pit is covered closely, all the air holes and cracks are closed, and the coal allowed to cool. The heat, however, is such for some time, that if air is admitted the coal will ignite. What coal is wanted, is raked out of the pit through the covering with a rake having iron teeth about nine inches long, and the covering is immediately replaced. A pail of water should be kept on hand to quench any fire that may revive in the coal raked out. When the fire is totally extinguished, the coal may be stored in a closed shed for use.

Not the least value of charcoal is in its desodorizing properties, and a few pieces placed in a refrigerator, or upon meat or poultry in summer time, will keep it sweet for a week in very hot weather. For filtering water, it is also of the greatest value.—Cor. Country Gentleman.

WORTH FOR DRILLING BARLEY.—Prof. Wrightson, of Worcester, said, in a debate which followed the reading recently, of one of Lawes' experiment papers, that he had himself grown barley, and had got neighboring farmers to grow it, by sowing it at wider intervals than usual. Instead of 8 inches he made the alternate drill rows 16 inches apart. In that way, of course, seed was saved, and he was surprised to find that the yield per acre was not diminished in consequence of the course which he pursued. Others had followed the system with equal success.

THE EFFECTS OF LIME.—Lime improves the quality of any grain crop grown on land to which it is applied. The grains have thinner skin, are heavier and give more flour. The flour is said to be richer in gluten, but there is much difference of opinion on the subject. It is said to hasten the ripening of wheat, but our experience is quite different on this point, as we have known it to delay the ripening of grain crops. A more marked improvement is produced in both the quantity and quality of the Spring-sown than of the Winter-sown crops. It hardens the straw of cereals and prevents it from falling down under the weight of the ear. Potatoes, turnips, peas, beans, rape, colza, and all the brassica tribe, are greatly improved by lime. On flax alone it is injurious, diminishing the strength of the fibre. Hence, in Belgium flax is not grown on limed land until seven years after the lime has been applied.

CUTTING ALDERS.—A Country Gentleman correspondent says with respect to the time of the year for cutting black alders to prevent them sprouting again:—Many kinds of bushes will not sprout if cut in the latter part of summer. It is an old saying, that bushes cut in the old of the moon in August, will not sprout. I have tried it with good success generally; but what we call white bush will sprout, and I have sometimes thought grow more thrifty. In regard to black alders, I have cut them at all seasons, but prefer to cut them in March or April, before the frost is out of the ground. As they usually grow on moist and marshy land, the frost holds them fast, and the grass and fern sprakes are not then in the way, so that a man can cut a third faster than in the latter part of summer, and time is not so valuable. The philosophy of cutting alders in the spring is this: The sap will run profusely from the stubs and they bleed to death, so they have not strength to grow sprouts.

DRILLED VS. HILL CORN.—The New York Tribune instructs an enquiring correspondent after this fashion:—Drilling corn, i. e., raising it in continuous rows about 3 1/2 feet apart, and a stalk once in about six inches in the row, undoubtedly gives more corn and more stalks to the acre than planting in hills three feet apart each way, for the very simple reason that it is practicable to raise more plants in drills than in hills. If the plants are six inches apart, we will have as many on an acre as we would if we planted seven kernels in hills. Seven kernels are too many in one hill, but when six inches apart in rows, the roots have a much better chance to find food, particularly during the early growth of the crop, and this is important. Where the land is in good condition, and few weeds or foul plants are expected, drilling is the best method, and will give 60 bushels about as often as hills will give 50 bushels to the acre. There is a machine for planting in drills, which will plant about eight acres in a day used by one man. If the ground is hilly, or much infested with foul plants, such as quack-grass, hills are more convenient as being susceptible of cultivation both ways by horse power; the land can be much more perfectly tilled. High farming alms or drills and two of the best farmers this country ever had—John Johnston, near Geneva, and A. B. Dickinson, formerly of Steuben Co., N. Y.—both practiced raising their corn crops in drills. But they were in the habit of planting corn on clean land, preferring to kill weeds while raising crops that required less manual labor and admitted of more horse work.

Grasses and Forage Plants.

Grasses for Partially-Cleared Lands.

EDITOR CANADA FARMER:—What is the best mixture of grass seed for securing a permanent pasture on land partially cleared of its timber?

Darham, Ont.

AMATEUR.

Orchard grass is by far the best grass for growing in situations where the soil is shaded. With the Orchard grass can be mixed White Clover, Red-top, Timothy, June or Blue-grass, and rough-stalked Meadow grass; but the Orchard grass should form the bulk of the seed sown.

Ribbon Grass.—"Phalaris Arundinacea."

EDITOR CANADA FARMER.—What is the name of the grass which is grown in the gardens as an ornament? I have seen it for the last ten years back, but I never heard it called anything but "Striped Grass," and I never heard of its being analysed, to see whether it contained good qualities as a pasture grass or not. There is one good thing about it:—Frost does not kill it out. I have noticed it at various stages of its growth and from its appearance it gives me reason to suspect that it might be made of use in some of our pasture fields that look so bare. It grows nearly as high as timothy, but it acts quite differently. After the seed is ripe, two or three inches below the seed, the stalk shorts and keeps green. That is as much as to say that, if in a field, it would keep green all the summer round. It grows a nice firm stalk, well-covered with leaves. A grass which ripens its seeds and keeps its stalks and leaves green and branching seems as though it might be useful for more than its looks in a garden.

Oncida, Ont.

J. E.

The grass enquired about is the *Phalaris Arundinacea*, Ribbon Grass, improved by transplantation into gardens and cultivation in a good, dry soil. Its natural habitat is swamps and wet borders of streams. If replanted in marshes, it would revert to its original type, and as an agent in reclaiming a marsh its mass of thickly interlaced roots would give it great value.

In Sweden it is extensively used for fodder, being mown twice a year. An analysis of its constituents gave:—water, 68.9; protein, 1.9; fat, 0.4; heat producers, 12.6; woody fibre, 13.5; ashes, 2.6. The famous Woburn experiments indicated this grass to be superior to Timothy for breeding purposes. From an acre of *Phalaris* grown on strong, tenacious clay, and cut flowering, 34,031 pounds of grass were grown. On being dried, this lost 17,015, and yielded 2,126 pounds of nutritive matter. Timothy, cut when flowering, yielded to the acre 40,837 pounds, lost 23,481 pounds in drying, and gave but 1,595 pounds of nutritive matter. Though the chemical tests show the *Phalaris* to be superior to Timothy, cattle, here, do not thrive on it, either as pasture or hay, and will not eat it unless they can get nothing better. The roots are relished by pigs, and are probably nutritious. It would be exceedingly difficult to eradicate the *Phalaris* when once it got established, so, if our correspondent feels inclined to give it a trial, we advise him to use care in selecting its location. The seeds run about forty-eight pounds to the bushel. Half a bushel to the acre would be sufficient. It is usually propagated by cuttings of the root, laid about a foot apart in early spring, in well prepared ground.

The Prickly Comfrey.

The plant illustrated on this page is the Prickly Comfrey, a new forage plant, a native of the Caucasus. It has been grown in Ireland for some years, and in Leicestershire and some other parts of England. A Leicestershire grower says of it, that it is likely before long to supersede many of the forage plants now in cultivation. The advantages which are claimed for it over other plants are these:—It affords a cutting earlier, and lasts longer than almost any other. If cultivated upon a good deep soil, it will yield a heavier crop than any other plant; and, when once planted, it will last for ever. It is very hardy, and found to produce heavy crops upon any dry soil, although poor and unsheltered. It is much relished by horses, cows, sheep, pigs, rabbits and poultry. Horses are found to work well upon it, and are not "soft" as they are when they are fed

on other green food. Spring is the best time to plant it, but no time comes amiss to it, except that severe frost might kill newly-planted roots.

The Leicestershire grower above alluded to, Mr. Kinard B Edwards, gives these details as to the mode of growth:—Procure root cuttings, and mark out your ground, and dig good sized holes over the entire piece, each being two feet apart every way. Into each of these holes throw a good shovelful of dung, and on the top of this place a root-cutting, drawing the earth over it, leaving the crown about two inches under ground. Keep the ground clean and free from weeds, and in a few weeks a large quantity of leaves (something similar to the Foxglove, or Wild Comfrey) will be thrown up by each plant. These should be cut when they have grown to a height of two to three feet, and before the blossom opens. In about six weeks a second cutting may be obtained, and so on throughout the summer; each time affording from ten to fifteen tons of fodder to the acre.—The first year as much as 20 tons may be obtained; the second year 50; and every year after, 80 to 100 tons. But to do this, it will be necessary to lay on a heavy amount of manure, as, in this respect, Comfrey is no exception to the rule which demands an equivalent being returned to the soil to keep up its fertility.

Mr Edwards has, during the last four years, cut from 80 to 100 tons to the acre, some plants rising to a height



of 5 feet, each plant averaging 10 lb. to 12 lb. to the cut. It may be cut with a hook, tied up in bundles, and so carried to the stall or farmstead, as required, day by day. For amateurs and cottagers having a horse, cow, or pig, few crops will be found so useful or more easily cultivated. A few hundreds of root-cuttings will suffice to make a start, as every spring the roots may be raised and divided into twelve parts, and twelve times the area of ground planted.

The Virtues of Red-Top.

Prof. Welch, Agricultural editor of the *Chicago Times*, points out some of the weak points of Herd's-Grass or Timothy, and then proceeds to compare with it the Red-Top, thus:

Red-top is the reverse of timothy in almost every essential particular. It comes into the soil easily, and goes out hard. It seems to be as naturally adapted to our soil as the native grasses of the prairie. It is very tenacious of life, enduring heat and cold, drouth and flood. It forms a firm, compact sod, uninjured by the feet of animals, or the flow of water. It produces a succession of rich foliage, from early Spring till late Autumn. It will bear close cropping, and not suffer from the effects of it. It occupies the whole of the ground, leaving little chance for weeds to grow. It spreads from the roots, and therefore does not require to be re-seeded every few years, as in the case of timothy.

Red top is admirably adapted to withstand heat and cold. Its roots are spreading, so they take firm hold of the soil. It produces foliage immediately on the surface of the ground, so that the roots are protected from the heat of the sun and the cold of winter. They also serve as a sort of mulch, which prevents injury in time of severe and long continued dryness. There is little danger in cutting red top too close to the ground, as it springs up immediately when pared to the very surface of the soil. When the late

frosts bite the leaves of red top, they lie close over the roots, and afford protection during the winter.

Red top, when green, is not the equal of blue grass, and when dry is not the equal of some sorts of hay. But in either case it is above the average of our wild or cultivated grasses. Unless it grows unusually rank, is injured in curing, or cut when too ripe, it is relished by all kinds of stock, and is eaten very clean. Unless rains are when in curing and stacking it, there is danger of its becoming musty. On rich lands it may usually be mown twice in a season, and the second crop will make excellent food for young cattle. On rich pasture lands it is well to mow it after it goes to seed, as by so doing, a fine crop of foliage immediately springs up after the scythe.

Red top does best on rather cold, moist soils, and may be grown with the best economy on lands that will not produce good crops of corn, grain and potatoes, in ordinary seasons. An excellent location for this grass is at the foot of hills and banks, from which water oozes a considerable portion of the year, or where water remains late in the spring. Undrained meadows, where timothy and other grasses do not flourish well, will produce good crops of red top. The character of this grass varies much, from the soil and situation where it is produced. On dry, gravelly soils it is short, and has hard, wiry stalks that are little relished by stock, either as grass or hay.

As an example of the endurance and productiveness of this grass, the writer of this has an acre of well sown red top, which has been mown sixteen years, and never received any manure. Last year it produced over two tons of excellent hay, and was afterward, as in previous seasons, pastured in the fall. A small amount of red clover for years has maintained itself in this patch of red top, and has apparently been protected by it, as it has died out in other portions of the same field, where it was sown with timothy and other grasses.

HARRIS LEWIS says he has cut eight feet of Orchard grass in one season—four mowings.

SOWING GRASS SEED.—A correspondent of the *Ohio Farmer* says:—Our experience of twenty-five years may be worth something, and we will give it for the benefit of your thousands of readers. We try to sow on the last snow of winter. Eight quarts of timothy and four quarts of clover will give a good seed. Never failed to have the clover do well but twice in twenty-five years. Last year we sowed a little too early, and I lost most of the clover on all but four acres, which we sowed a week later and had a splendid catch. Late years I put in, say two quarts of red top, which will hang on and come in when the other grasses fail. It makes a better sod also.

EXPERIENCE IN PLASTER WITH CLOVER.—In the spring of 1873 I sowed one field of eight acres to oats, thoroughly harrowed one way, then sowed on clover seed and cross-harrowed the field. I then put on about three pecks of plaster to the acre, and the result was a good yield of oats and a fine catch of clover, which grew finely through the summer, and last season produced a large burden of number one clover hay. This I am now feeding to my calves, for I prefer it to any other, when properly cured, for calves should have the best. The same week in which I seeded the eight acre lot, I seeded one of four acres, and in precisely the same manner, save that I sowed plaster on two acres of it. The other two acres went without plaster. Now for the result. Where the plaster was sown, the clover grew as finely as in the eight acre lot, and produced as much hay last season; while on that without plaster the yield of oats was much lighter, and what clover seed sprouted, or nearly all, died from the effects of the drouth, so much so that it would not pay for harvesting. The soil was sandy, what we term here sand knolls, and poor at that.—*Cor. Western Rural.*

PEA-VINE CLOVER.—An *Ohio Farmer* correspondent advises an enquirer to sow pea-vine clover for pasture. He says:—My plan is to seed with timothy, in the fall, with wheat, then sow one bushel of pea-vine clover to eight acres. This will produce about twice as much pasture as the common clover, and if you have good soil, and it seeds well, you will have a heavy layer of clover, tramped down to rot on the ground. In this way you can enrich your soil and keep more stock than by sowing common clover. I have been cultivating this clover for the last six years, and would pay twice the price of common seed rather than to do without it. I usually pasture two years, and then follow with corn, but the cut worms were so bad, that in July, '73, I changed my plan. I ploughed a field of pea-vine clover that had been pastured in '72, and from eight and one-fourth acres, without manure, I raised 250 bushels of wheat. I had to harrow down the clover and ride the harrow before I could plough it, and the plough would then choke. I shall follow the wheat with corn. Pea-vine is nearly two weeks later than common clover, and should not be pastured too soon. To save seed, pasture till the middle of June, after which it will fill well, and yield more than the common clover. I made four tons of hay last year, from a field that had been pastured all summer, and it was as good hay as ever I saw, but it was so dry that it cured very quickly.

Implements.

Turnip-Thinners.

One great disadvantage which attends the growing of root crops on this continent is the amount of labor required in thinning and harvesting them; and where, as in the Dominion, labor is not only high-priced but scarce, these disadvantages amount, in some cases, almost to a prohibition. Anything, therefore, which will tend to reduce the cost of this labor, or to render it a mechanical process, will be of interest. A correspondent of the *North British Agriculturist* mentions, with much approval, an implement lately invented by Mr. Dickie, of Girvan. It is described as possessing a vertical, not horizontal motion. The motive power is derived from the carrying wheels, 40 inches in diameter, which drive a pair of vertical spindles, to which are attached the hoes. By a combination of spring-balanced levers, the hoes can be raised and depressed with ease, to suit any inequality that may exist in a turnip drill. Another special feature of the machine is the peculiar delicacy with which the plants are uprooted. The hoe, having a circular movement, passes and repasses through the same space, laying the loose plants in the drill with wonderful care. The spindles can be regulated to fit any width of drill, and the hoes can also be regulated to leave the plants any required distance, with as few clumps as may be desirable. Another feature of the machine is a handy steering apparatus, which enables the driver to take the machine over all kinds of land, whether steep or side-lying, and perform the work as effectually as on the level. The implement will be exhibited at the coming Ayrshire Agricultural Show.

We mentioned this matter of turnip-thinning to a gentleman who called in upon us recently. He tells us that he himself had been thinking the matter over. He considered the above described machine to be a more costly one than most Canadian farmers would buy, and he mentioned that he had nearly perfected the idea of a turnip-thinner which would be more suited to our country, both in efficiency and price.

¶ Farmers of the Future—Ladies and Cripples.

It is not probable that, in the now settled parts of the Dominion, riding ploughs and cultivators will be used so extensively as they are getting to be used on the level, stoneless and stumpless prairies of the West. Gang-ploughs are coming rapidly into use, however, and, in particular instances, sulky ploughs and cultivators may be found valuable. An especial virtue of sulky ploughs is the ease with which enterprising young women and men who have lost a limb can work them. We would not, for worlds, be considered as advising young ladies to employ their time in ploughing and cultivating, but we will say that they could scarcely be employed more usefully, and that no one whose opinion is worth a cent would think any less of them for doing it. There is a lady-farmer in Illinois, a widow, who ploughs, cultivates, mows and reaps her own crops with these implements. Another Illinois farmer is a veteran who lost an arm and a leg in the late war. He does all his plowing with a sulky plough, drives his planter while his boy drops, and uses a sulky cultivator. With the help of these implements, he is able to do a large share of his farm work himself, while with ordinary ones he could do nothing.

An Improved Corn-Marker.

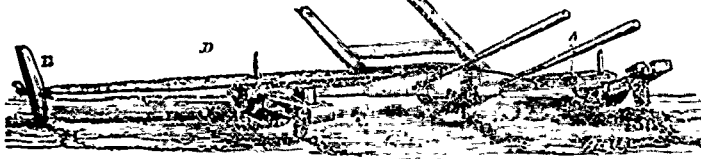
The corn-marker, of which an illustration is given on this page, is the invention of Mr. John Bartlett, of Oshawa, Ont. The advantages it possesses are:—That it will mark equally well on uneven as on level ground; that it is adjustable so as to mark any width desired; that it is so simple that any farmer can construct it out of materials always at hand; that the inventor will not patent it, so there will be no royalty to pay.

The marker may be made of 2 x 4 pine scantling—one piece 8 ft. long, marked (A), in which are bored the holes (1½ in.) 1, 2, 3, 4, 5. The marker runners (B) may also

be made of 2 x 4 scantling, pine or any other wood (18 inches long). Through the runners are bored 1½ inch holes; through which are inserted the pin (C) made of tough hard wood, which is driven from the bottom of runners, with the end left large, so as not to slip through. The pin should be about 14 inches long.

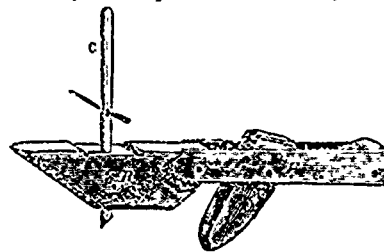
The pin (C) may be left to project about 1½ inches at the bottom. By the model, by driving out the nail in the pin (C), the marker runners (B) are easily changed to the different holes 1, 2, 3, 4, 5, to mark 4ft., 5ft., 6ft., 7ft., 8ft., or any other distance that may be desired, by having a number of extra runners and pins. It may be made to mark rows 1ft. apart, or even half an inch.

The hinged guide marker (D) has five holes to correspond



to holes 1, 2, 3, 4, 5. The pins (C) go through the holes in hinged marker, steadying it, and working up and down. At the head of hinged guide marker (D) is placed a half-moon shaped piece of wood, which is easily regulated to correspond to holes 1, 2, 3, 4, 5, and is kept in place by a wire pin.

The hinged feet of the markers may be made of wood or iron. If of wood, they may be made of any tough wood, either capped with iron or not, as desired. If of iron, the foot may be made of ½ inch iron, or an old saw-blade would do, bent to fit in the round hole (E), and regulated and fastened by a round pin. The hinged feet are



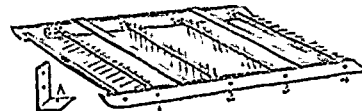
small boxes in which to place stones or soil to serve as weights.

Immediately back of the shafts is a box for weighting the main part (A), where the shafts are put on. For shafts, 2 poles driven into 2 inch auger holes may be used, or the shafts of a light waggon may be used on the marker. The handles are made of stakes driven into auger holes. This marker could easily be rigged with a seat for driver.

A Combined Pulverizing and Smoothing Harrow.

The illustration below is of an implement which the inventor calls a "combined pulverizing and smoothing harrow." He does not claim perfection for it, but gives it for what it is worth, adding that so far as he has tried it, it supplies several deficiencies which he has observed in other harrows. We copy the cut and its description from the *Country Gentleman*.

As will be seen, the position of the teeth can be placed at any desired angle that the condition of the soil or other



circumstances may seem to require. One set or more may be pointed forward, perpendicular, or backward, and a variety of combinations can be made, as to positions of the teeth, at the same time. Also, the teeth may be driven through the tooth bar more or less, as their depth in the soil may be desired. This harrow is arranged for a tongue to be put into the "roll" at the front end, as shown in the cut, and to be drawn by two horses. By taking out centre teeth it is calculated to harrow young corn, potatoes, &c., by straddling the rows. The tongue should be curved upward from the roller like the shafts of a buggy, that the direction of the draft may cause the harrow to have equal

or level bearing when all the teeth are in perpendicular or backward position. When pointed forward, the tendency will be to run into the ground like a plough, as will be obvious. When all the teeth are inclined backward for smoothing purposes alone, an added weight upon the harrow may sometimes be necessary.

The teeth in the plan sent are 4 inches apart, which, for pulverizing purposes, is too close, as they gather rubbish like a rake; they should be not less than 5 inches apart unless for smoothing, when 4 inches would be right. This variation in distance apart might be arranged by having two sets of holes at the different distances desired. The teeth are simply driven through the holes and made to be tight enough to hold them firmly in place, but so as to admit being driven through farther or less, as required. The side pieces or runners are of 1½ inch plank, 6½ feet long by 5 inches wide. The tooth bars are 2 by 3 inches and 4 feet long inside the runners, inserted like rollers, with shoulders, in 1½ inch holes in the runners or side pieces. The teeth are of ½ inch round steel, 10 inches long, and sharply pointed. One end of the right angled plate of iron, A, is bolted on the front edge of the tooth bars, the other end lying flat against the side piece. (This is drawn to a larger scale than the harrow.) Holes to correspond with those in the iron are bored through the side pieces (shown at B), through which iron bolts or pins are inserted to hold the tooth bar in the desired position. With two holes in this iron plate and three in the side piece, as shown in the plan, the position of the teeth can be graduated to any desired angle. When hauling the harrow from one field to another, all the teeth can be inclined backward, which will cause them to easily slide over obstruction. Any farmer with ordinary mechanical genius, and a few simple tools, can make the frame, so that the cost is only for teeth, plates and bolts—the whole cost of mine was about eight dollars.

Wheel-Tires, Harness and Horse-Stalls.

A correspondent sends the following compact items of experience, to the *Germantown Telegraph*:—It don't pay to reset thin wheel-tires. The chief strength of the wheel lies in the rim.—There is great economy in soaking the felloes of business waggon wheels with raw linseed oil; it will preserve the wood and save the necessity of frequent tire-setting, an operation to be avoided.—When you buy a new fork or hoe, good farming requires that you oil the handle. It costs but a trifle, and your tool looks better, and will wear longer.—Good harness kept soft with neat-foot oil is a credit to the owner, and a comfort to the animal that wears it. Soft harness is stronger than a dry, hard one. It is slightly elastic and bends without breaking.—Horse-stalls are usually made too narrow. A tired horse needs room to turn over and stretch his limbs; fatal injuries come from confining spirited horses in short, narrow stalls. A friend had the best one of a valuable span kicked by a strange horse in a short stall, which broke a leg. A pair of handsome western horses were brought to take the place of the bays, and one of them in one year knocked down a hip, perhaps by the narrow stall, and is now of trifling value.

GRINDING TOOLS.—Grinding tools calls for the exercise of great judgment in the determination of the angle, and skill in handling so as to secure a true edge. Workmen make a mistake in grinding down to the edge. This should never be done unless it is nicked or otherwise rendered irregular, as the grindstone leaves a rough edge which must be cut away by the oil-stone. By grinding well down to the edge, without reaching it, the iron is given the required shape, and a very little rubbing on the oil-stone will produce a good keen edge.

TO PREVENT SPLITTING OF HANDLES.—All carpenters know how soon the butt-ends of chisels split, when daily exposed to the blow of a mallet or hammer. A way to prevent this consists simply in sawing or cutting off the round end of the handle, so as to make it flat, and attaching, by a few small nails on the top of it, two round disks of sole-leather, so that the end becomes similar to the heel of a boot. The two thick neases of leather will prevent all further splitting, and it, in the course of time, they expand and over-top the wood of the handle, they are simply trimmed off all around.

IRONING WHIFFLETREES.—If the end of the whiffletree is rounded, so that it will not catch on trees or posts, and a flat bar of iron, as wide as the thickness of the whiffletree, be wrapped around the end, reaching far enough back from the end to allow two bolts or rivets to go through the bar and the whiffletree—about four inches—this part of the ironing is then finished, to last until the wood is worn out. The rivet or bolt nearest the end should have a nut on the back end, and an eye and hook on the front. Whenever these are worn, they can be replaced without taking off the iron from the whiffletree.

Horticulture.

THE ORCHARD.

The Sap-Sucker vs. the Apple Moth (*Atticus Cecropia*).

EDITOR CANADA FARMER:—Allow me to call your attention to an enemy of the *Atticus Cecropia*, of which, as yet, I have seen no notice in your valuable paper, namely, the Sap sucker, Downy Woodpecker, or *Picus pubescens* of naturalists. I have observed this insatiable and untiring destroyer of insects preying on *Cecropia* larva in all stages of growth, and also on the pupae, perforating, with its sharp bill, the tough silken cocoon.

On the 10th of June, 1871, I put, on three apple trees, 345 *Cecropia* larvae, in excellent condition, just after the first moult. This was in the city of Toronto. The trunk of the furthest tree was twenty yards, and the nearest nine yards, from the front door, while the pathway from the street was under their branches. Yet, for all this seeming protection, in a week's time I noticed the larvae rapidly decreasing, and no cocoons could be found. This led to closer observation, when I detected a Lady *Picus* unfeelingly murdering my pets, not satisfied although three were dangling from her bill. I summarily turned her out of the patch, but, in an hour she was back, and soon became aware that my bark was worse than my bite. She would sit on a limb close by, looking at me, listening to my "hard words," and with her rather harsh, though not unpleasing "carrip, carrip" said,—well, I thought she said, or seemed to say—"No, you wouldn't. You are too good-looking a man to do it."

So it went on, until in place of having 345 cocoons, I had three, which I allowed to remain on the trees. In January last, she came back and finished them. I was fortunate enough to see her feeding on one of them, and so identified *Picus pubescens* as an enemy to the *Cecropia* in the pupa state.

Early in the spring of 1872, while in the Township of Whitechurch, I collected seventy-three *Cecropia* cocoons, every one of which was killed by a bird, either *Picus pubescens* or, perhaps, some allied species.

W. BRODIE.

Toronto, Ont.

To Obtain Fruit from Barron Trees.

A correspondent of the *American Agriculturist* says:—I wish to describe to you a method of making fruit trees bear that I blundered on. Some fifteen years ago I had a small apple tree that leaned considerably. I drove a stake by it, tied a string to a limb and fastened it to the stake. The next year that limb blossomed full, and not another blossom appeared on the tree, and, as Tim Bunker said, "it got me a thinking," and I came to the conclusion that the string was so tight that it prevented the sap returning to the roots; consequently it formed fruit buds. Having a couple of pear trees that were large enough to bear, but had never blossomed, I took a coarse twine and wound it several times around the tree above the lower limbs, and tied it as tight as I could. The next spring all the top above the cord blossomed as white as a sheet, and there was not one blossom below where the cord was tied.

A neighbor, seeing my trees loaded with pears, used this method with the same result. I have since tried the experiment on several trees, almost with the same result. I think it a much better way than cutting off the roots. In early summer, say June or July, wind a strong twine several times around the tree, or a single limb, and tie it, the tighter the better, and you will be pleased with the result; the next winter or spring the cord may be taken off.

RUSSIAN APPLES IN PRESCOTT COUNTY:—A correspondent of the *Montreal Witness*, dating from Little Rideau, Ont., says that the Fameuse, St. Lawrence, Pomme Grise, etc., are not hardy enough in his vicinity, except in a few favored localities. In the fall of 1869, he says, "I procured a few trees from the vicinity of Montreal, numbering in all about 100, principally Fameuse, St. Lawrence, and Russian varieties. In the spring of 1870, these were all planted side by side, and flourished up to the autumn of 1872; this was a remarkable season in consequence of the great rains, turning our fields into mud-holes, which caused rapid vegetation until late in the season; then suddenly checked by frost. Up to this time I anticipated no danger. In the spring I examined the trees, and discovered that some of the Canadian varieties were completely destroyed, and the rest badly injured; it was quite the reverse with the Russian varieties, as not one of them was injured."

Some Additional Hints on Grafting.

EDITOR CANADA FARMER:—Your instructions on grafting in a recent number were full and precise, and as intelligible as they could be made without the aid of illustrations. Allow me to give a few additional hints founded on my own experience in orcharding.

You give directions in cleft-grafting, to cross the scion and the stock, "slightly." Now, instead of crossing them slightly, cross them much. The advantages are:—That the scions are almost certain to grow, as the flow of sap is ensured by the crossing of the barks of scions and stocks; that the direction of the scions gives a better chance that in their future growth, they will not interfere with each other, and that they will ultimately form a better head. There is, also, no need of cutting one out in the after-growth; for, if it was intended to form the head with one scion only, other methods should be employed, such as saddle grafting, splice-grafting, or a plan of cleft-grafting especially adapted for the purpose. It is usual after applying the grafting wax to the top of stock, and down the cleft, to put a little upon the top of scion. It does no matter if the lower bud of scion is covered, as it frequently



Old Method.



Correct Method.

is, with the wax, as it will push through in growing. Three buds are always used on each scion. Scions in this country are usually cut in January, and tied in small bundles, a flattened pointed stick, with the name written on, thrust in the middle and packed in moss, saw-dust or sand in a cellophane that does not freeze. I used saw-dust. The grit of the sand is hard on the knife when cutting scions for root grafting &c. Scions are cut from the growth of the previous year, and the top bud on the soft part of the top of the twig is not used.

The best grafting-wax is made from equal parts of bees wax and tallow, and double the quantity of clean resin. Melt the tallow and wax, and then add resin and stir thoroughly. This process of stirring cannot be too much insisted upon; it must be thoroughly done over an even fire, to ensure a proper incorporation of ingredients. When done, pour into a pail of cold water, roll up your sleeves and grease well your hands, and take off lumps about the size of a goose-egg, and pull until tough and white, when put away in well oiled paper or rag. All other waxes are vexations of spirit and humbugs. It is hardly necessary to remark that more tallow softens the wax, etc., etc. This grafting-wax will stand the heat of summer quite well.

Commence grafting in the spring as early as possible and continue until the formation of fruit. I have had very tolerable success when the apples were as large as robin's eggs (I mean the Canadian robin—the migrating thrush).

These remarks apply to apples and pears. Plums, peaches, and cherries are usually budded. I have, however, grafted all these and they did well, only somehow in many cases the graft outgrew the stock and made a most unsightly affair.

Three and four grafts are sometimes set in very large limbs, in which case, a cross cleft is made. Set grafts side by side—never top and bottom: i.e., on opposite sides of stock, on same plane, never one over the other.

Toronto, Ont.

AN OLD ORCHARDIST.

WHIP-GRAFTING.—This method can be used on large branches by setting the scions on suitably placed branchlets. The only equipment necessary for it is, (1) the scions, (2) a fine-edged, thin-bladed knife to shave them, and the stalk, and (3) a roll of waxed strips of cloth. Grafts form adhesion or growth only along the line between the wood and the bark, where it meets the corresponding line in the shaved face of the stock, and where it is in close contact with it. In whip-grafting these can scarcely fail to meet somewhere, either by coincidence or crossing, and the wrapping will secure close contact. Finally, the waxing, which serves to prevent the ascending fluids from escaping

at any part of the cut, or from being dried by the external air instead of pressing on to the support of the scion. In nurseries a single spiral wrap of waxed cloth is used, and this unwraps of itself by yielding to the swelling of growth. But the amateur will find it safest to apply an external ligature of lin-bark or yarn, especially when grafting very early, and this must be slit down or otherwise loosened as soon as leaves have opened on the scion.—*New York Tribune*.

Setting Fruit Trees.

A friend gives the following mode for setting out fruit trees, which will perhaps come in very well here, as the season is at hand for planting orchards. Mark out the ground the distance you desire to set your tree; take the tree you desire to set, and stand it upon the ground, mark with your spade, tracing each root; remove the tree, and dig away the dirt as traced while the tree was standing; when you have finished this, with a sharp knife cut away three or four inches of each root, and turn the end so cut down into the hard ground, and force as far down as you can get it—this will hold the tree in place, and will require to stake; the place for the tap root should be dug out and the ground made loose around it; do not set deep, this is not its natural way of growing. You will find your trees will live better, and are more thrifty, and your orchard will be at least twelve months ahead of one set in the ordinary way. The reason is very clear that when fastened in this way, the blowing of the tree by the wind can never break the feeders that are making out from the roots.

The many farmers that I have talked with upon the subject, all agree that in the ordinary way of setting, that of digging a square hole, and filling with compost or other manures, that the tree will do well for two years, after that time they will commence dying, and upon examination you will find the roots have grown and filled up the square hole you have dug, and being unable to penetrate the hard ground, return to the rich mould around the tree until a solid mat of roots are formed. In the meantime the tree will have a crop of apples, and being unable to bear to maturity, it will die. This is the experience of many farmers around me—also my own.

The Cut-Worm—A Bud-Eating Insect.

Prof. W. J. Beal, of the Michigan Agricultural College, writes thus, in answer to an enquiry by a Michigan correspondent of the *Country Gentleman*, who enquired for a remedy for an insect which was eating out the buds of his young trees:—It is most likely one of the cut-worms. We have thirteen or more species, and on sandy soil they are often a great pest. They are nocturnal, hence not seen on the trees in day time, when they lie buried in the soil.



The following remedy is effectual, yet cheap, and is used in some portions of the State. For each tree, cut a piece of tin, with a round hole in the middle, and a slit on one side. Place this on the trunk of the tree, and insert a rag or something to exactly fill the hole about the tree. The worms cannot climb a tree when served in this way.

TOO MANY VARIETIES.—The commonly-named *Noman's Gazette*, so termed, may be, because no man that we can ever heard of it before, gives a little bit of conversation which some Canadian orchardists will know how to appreciate:—One man said, "I would give \$5,000 to-day if I could change my varieties." Another man says, "My orchard would be worth \$20,000 more if it was of the best varieties." In another man's orchard one-fifth pays more than the other four-fifths.

RIND-GRAFTING.—Says an English correspondent:—For large branches, I prefer rind grafting, and if carefully performed the operation rarely fails. The branches should be sawn off in a sloping direction, so as to have the cut face on the under side to prevent wet lodging on it, and setting the wood before the wound has healed over. The saw-cut should then be made perfectly smooth with a knife, or sharp broad chisel. For rind grafting the scions should be cut flat on one side, beginning about 3 inches from the end, and tapering off gradually, so that the point to be inserted under the bark of the old branches headed back is made very thin. The point of the knife should be drawn through the bark where it is intended to place the scion, so as to allow it to be lifted from the wood before pushing in the graft. This operation can be best performed by cutting a piece of hard wood just the shape of the graft to be inserted. By having this a trifle larger than the scion, and thrusting it under the bark, the graft can be pushed in tightly without any fear of injury." Then cover with grafting wax, and bind with soft string as previously described in the *CANADA FARMER*.

THE FRUIT GARDEN.

Fruits for Small Gardens.

We make the following extracts from an article in the *Horticulturist* by the well-known authority, Andrew S. Fuller:

Garden Arrangement.

Fruit trees, such as pears, apples, plums, and peaches, should be planted very sparingly in small gardens. Most persons plant too many large trees, and their grounds soon become so shaded that the really more valuable products have to be excluded. A few dwarf pears, or apples may be introduced, or a less number of standards, if planted where they will not shade ground required for other purposes. There are vegetables, and some of the small fruits, which succeed well in partial shade—therefore may be cultivated among trees, for a few years at least; but such an arrangement will necessarily be only temporary, and calculations must be made accordingly.

Blackberries.

Some may object to introducing the blackberry into gardens on account of its thorns, as well as the habit of most of the varieties in producing suckers at a considerable distance from the main plants. But if the canes are trained to stakes or trellises, and the suckers cut off with a hoe once or twice during the summer, the objections named are scarcely worthy of the least consideration. It is only through neglect that a "blackberry patch" becomes a nuisance. North of the latitude of New York city, we have no variety which has been thoroughly tested, that equals the Kittatinny in size, productiveness, and hardness of the plants. The Dorchester is a little earlier, not quite as large as the Kittatinny, and a valuable sort for the north. South of the latitude named, Wilson's Early merits attention, it being the largest variety known, but not superior to the Kittatinny in flavor. Good, strong, one-year-old plants, set out in spring, will produce canes large enough to bear a moderate crop of fruit the next year. The culture required is merely to keep the ground rich, tie up the young canes to some support, and cut out the old ones every season after the fruit is gathered.

Currants

There are some fifty or more varieties of currants in cultivation, but I think the following five sorts comprise all the really valuable merits known to belong to our cultivated kinds.—Black Naples, Red and White Dutch, White Grape and Versailles. It is almost impossible to make the soil too rich for the currant; and one rather heavy or clayey is preferable to a light loam or sand. But they will thrive in any kind of soil not too wet, provided it is rich. In warm climates, and rather dry soils, the ground among the plants should be constantly covered in summer with some kind of coarse mulch. This will keep down weeds, and the soil cool and moist. Young plants, of one or two years growth from cuttings, are better than older, and the greater part of the top should be pruned away at the time of planting. Pruning, in after years, consists mainly in thinning out both old and young canes, as they become too numerous.

Gooseberries

There are few localities where the large European sort will thrive without receiving extra care and attention. If such are tried, the main points to be observed are to keep up a supply of young, thrifty plants, discarding the old ones as soon as they become diseased. Clean culture, or muleching the ground, and an annual thinning out of the young shoots to prevent overbearing, are the best safeguards against the great enemy of these fruits—the miller. Our native sorts succeed in most localities in the northern States, and with no more attention than the currant, at least no more than this fruit should receive Smith's Improved, Downing and Houghton's Seedling are among the very best, although of small size when compared with the foreign sorts.

Grapes.

The grape may be admitted pretty freely into the smallest gardens, because the vines may be trained over the fences, upon arbors, or against the sides of buildings. A rather dry, deep and rich soil is requisite. Then start with young, thrifty vines, avoiding the one almost universal error of permitting the vines to overbear. Haste in this has ruined more vines than disease; but there is safety in the free use of the pruning knife in fall or winter, according to locality. The very best varieties are usually the most uncertain; therefore, safety bids me to put Concord at the head of the list. Then one may add a Delaware, Iowa, and, perhaps, a vine of the old Isabella, if in some favored locality. Of course, there are hundreds of other sorts which are good or excellent in particular locations, but experience alone can determine their value.

Huckleberries.

A huckleberry bush or two, either of the upland or swamp species, should be in every garden. They are seldom cultivated, but are worthy of far more attention than has been hitherto bestowed upon any of the native species.

Raspberries

Varieties of this fruit are so numerous that it is difficult to make a selection, unless one has had considerable experience with them in the locality where they are to be cultivated. What are called the Blackcaps will thrive

almost anywhere from Alabama to Canada; but not so the varieties *Rubus strigosus* (the species to which our native red sorts belong), or the *Rubus idaeus*, parent of all the foreign varieties, like the Antwerps, Franconia, and Clarke. The latter is the best variety I have ever grown, for a light, sandy soil; and it is quite as hardy as any of the high-flavored sorts. For the three best varieties, raised from the foreign stock, I would name Clarke, Hornet, and Brinkle's Orange. High culture and protection in winter may be necessary; but the returns will amply repay the cost. Among the very hardy, native, red sorts, the Wilmington and Kirtland are among the most valuable of the many which I have tested. The Philadelphia is a fruit of a purplish-red color, the canes hardy, and wonderfully prolific—an indispensable variety for the middle States; but neither sufficiently firm nor bright enough in color for a market berry.

Strawberries.

Plant a bed of Wilson's Albany first; then look about for better varieties, if they are to be had, is my advice to all new beginners in strawberry culture. This, like the Philadelphia raspberry and Concord grape, will be pretty certain to bear fruit, although opinions may differ in regard to quality. Plant in early spring, and make the soil rich; yes, very rich, if you would have large fruit and in abundance. On heavy, fertile, clay soils the Triomphe de Gand and Jucunda will produce abundant crops of very large berries; but on sandy soils they are of little value. Seth Boyden is a monstrous fruit, of fair quality. The plant is also a vigorous grower, and succeeds well in light rich soils. Charles Downing is also a valuable variety, succeeding over a wide range of country, and in almost any good soil. There are many other sorts perhaps equally as good for those who want plenty of strawberries, but there are none better. Lenny's White, and Ladies' Fane are superior in quality, but the fruit is generally like angels' visits—few and far between.

A NEW RASPBERRY BORER.—Mr C V Riley, of Missouri, describes a new kind of raspberry borer, closely allied to the peach-borer, and which bores into and feeds on the stems in a similar manner to the last named pest. Its name is *Egypia rubri*, or raspberry root borer. Though closely resembling the peach-borer, *Egypia cactoria*, it is distinct from it. The one kind never feeds on the trees of the other.

THE FLOWER GARDEN.

The Martynia.

The Martynias, of which an engraving is given below, are coarse, robust, hardy annuals, of a spreading habit, requiring at least three feet of space to perfect their growth. They are natives of Louisiana, Texas, Mexico, and farther South. The engraving gives a front view of the flower, which is tubular, and about an inch in length. The colors are yellow, white and purple, and one variety, *formosa*, is sweetly fragrant. The seed-pods are very curiously formed, as will be seen by the little engraving, and they grow six inches or more in length, the variety called pro-



boscidea having the largest pods, and these when about two-thirds grown and quite tender, are much prized for pickles. We are indebted to Mr Vail, of Rochester, for the cut.

GRAVEL WALKS.—A good gravel walk should be made by first excavating the ground 10 or 12 inches deep, then fill up with cobble-stones, about eight inches, the interstices being filled in with the smallest stones, then apply the gravel, raking off the small stones in it to lie at the bottom, as you proceed, leaving the walk, when finished, about four inches higher in the centre than at the sides, which at first should be about an inch above the adjoining ground, and in due time the walk will settle, and be right as regards dryness as carrying off water. A hand roller is a great help in making walks hard and compact. If no rain occurs immediately after finishing a walk, or a section of one, water freely from a water-pot and wait till sufficiently dry to allow the roller to pass over without the adherence of gravel to it, and in a short time the walk can be made firm and solid by the roller. Carriage roads to the stable, or around a dwelling, cannot be made permanently dry unless a thick bed of stones be first laid at the bottom.—*New York World*.

Ferns of North America.

The *American Garden*, which is a New York monthly, aged about one year, and promising well to fill the place on this continent occupied in England by its London namesake, has an exhaustive article upon the ferns of North America. It divides the 125 species of commoner ferns into six divisions:—The Cosmopolitan, Boreal, Appalachian, Pacific, Central and Tropical. The first three divisions only will be of interest to Canadian readers. And here let us entreat those of our readers who are thinking about taking up a study so interesting as the ferns, not to be discouraged by the hideous names which, in the interest of science, have been inflicted upon these most beautiful objects. Familiarity with the sesquipedalian epithets which nowhere seem so offensive and out-of-place as when applied to the modest, retiring ferns, will soon reconcile the tyro to a system of nomenclature, which, at first sight, seems to threaten the existence of the front teeth. By-and-by, "Scolopendrium" and "Acrostichoides" will glide out of the mouth with as little danger or exertion as "Hart's-tongue," or—there is no English name for the other that we know of.

Our cotemporary puts in the "Cosmopolitan" division, the *Pteris aquilina* (the common Brake), and the *Asplenium Trichomanes* (Maidenhair Spleenwort). The second group, the "Boreal," is a large one, inhabiting the Northern States and Canada, some of the species extending into Labrador, Greenland and Alaska. The species included are:—*Phegopteris polypodioides*, *P. dryopteris*, *P. alpestris*, *Struthiopteris Germanica*; *Aspidium lonchitis*, *A. aculeatum*, *A. filix-mas*, *A. fragrans*, *A. spinulosum*; *Scolopendrium vulgare*; *Asplenium viride*, *A. septentrionale*; *Pellaea gracilis*; *Lomaria spicata*; *Cryptogramma crispata*; *Cheilanthes argentea*; *Cystopteris fragilis*, *C. montana*, *Woodia hyperborea*, *W. glabella*, *W. Itensis*, *W. Oregona*, *Botrychium lunaria*, *B. matricariaefolium*, *B. lanceolatum*, *B. simplex*, *B. boreale*.

The third group, the "Appalachian," extends through the hilly regions of the States east of the Mississippi and northward into Canada, and comprises:—*Polypodium vulgare*; *Phegopteris hexagonoptera*; *Oncoclea sensibilis*; *Cheilanthes vestita*, *C. tomentosa*; *Pellaea atropurpurea*; *Adiantum pedatum*; *Camptosorus rhizophyllus*; *Asplenium filix-foemina*, *A. thelypteroides*, *A. angustifolium*, *A. ebenum*, *A. ruta-muraria*, *A. pinnatifidum*, *A. montanum*, *A. Bradleys*, *Dicksonia punctilobula*, *Aspidium thelypteris*, *A. Noveboracense*, *A. cristatum*, *A. Goldleanum*, *A. marginale*, *A. acrostichoides*; *Cystopteris bulbifera*; *Woodia obtusa*; *Lygodium palmatum*; *Osmunda regalis*, *O. Claytoniana*, *O. cinnamomea*; *Botrychium Virginicum*, *B. ternatum*; *Ophioglossum vulgatum*; *Asplenium marinum*; *Woodwardia Virginica*, *W. areolata*; *Schizaea pusilla*.

MY HYACINTHS IN MOSS.—I have in the greenhouse an ornamental wire basket, in which I put six hyacinth bulbs on the 2nd of January last, and to see them now I think you would say that is surely the place to grow them. The bulbs have produced beautiful spikes of flower and splendid large green leaves, while the roots have made their way through the moss at least three inches, and which cannot be less than 10 inches from the bulbs. Evidently they are now receiving support from the moisture of the house. Now, I think this basket filled in this manner would do very well for hanging in rooms, with a few small ferns planted inside of the rim, which is circular, to hang over, and a glass saucer, or other kind suspended under the basket to hold the water, and which would at the same time supply the roots with moisture.—*London Journal of Horticulture*.

THE CRANBERRY AS AN ORNAMENTAL PLANT.—A correspondent of *The Farmer* suggests utilizing this lowly denizen of the bogs as an ornamental plant for hanging baskets. He says: "I do not see how any one, who has ever noticed the delicate foliage and flowers of the cranberry, even when wild and uncultivated, could fail to be struck with its beauty. But my object now is to call the attention of your readers to its value when cultivated in pots, in the house, or, still better, in hanging baskets. When thus grown, the long, slender stems drooping from the basket, together with the rich fruit, form a most beautiful object. Let those who mourn that they cannot afford to purchase foreign novelties, make a rustic basket, and put a few cranberry plants in it, and hang it in the window, and they will say they never saw anything more beautiful."

THE VEGETABLE GARDEN.

The Field Culture of Tomatoes.

There is no vegetable which is liable to such sudden and exasperating drops in price as the tomato. When they first appear, everybody is after them, and dreams of wealth disturb the slumbers of the market-gardener. A few days pass, and tomatoes are not worth picking. It is essential therefore that tomatoes for market be brought to maturity early. How to do this, a New York correspondent describes:

About the 1st of March I sow the seeds thickly in a hot-bed or box in the house. About the middle of April I transplant into the frames from which I have removed my early cabbage and lettuce. I put them about six inches apart each way, which will give 72 plants to a 3x6 sash. It is highly necessary that we have the plants strong and stocky. I use no bottom heat, as this would make the plants too spindling. On all sunny days strip the sashes clean off, replacing them at night, until about the middle of May, when they should be left off entirely. In raising any plants we are apt to force them too much. I have seen more plants destroyed by a hot sun on the glass, suddenly raising the temperature of the confined air, than I have seen destroyed by cold. Besides, if plants are forced so much, after they are transferred to the open ground, it takes them nearly two weeks to recover.

Any soil suitable for a good crop of corn is rich enough for tomatoes. If the soil is very rich, we are apt to have a large crop of vines with very little fruit, and that will be late. It is better to choose a warm exposure, and probably a gravelly soil will be as good as any, though for most vegetables I would not choose it. Thoroughly plough and harrow the ground, and furrow out at 2½ feet apart each way. Into each intersection drop a shovelful of rotten manure. Don't throw away your money on commercial fertilizers. Cover the manure with a hoe. About the 1st of June carefully take up your plants with as much earth adhering as possible, and with the hand make a hole in every other hill in every other row and set the plant in it. It is better to select a rainy day for this work. In the remaining hills I set a cabbage plant, or plant an early potato or a few bush beans.

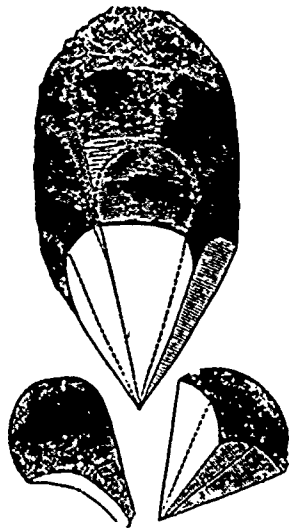
If the soil is suitable and the market will take them, we can sow a dozen radish seeds in each hill. I know that tomatoes are generally raised by themselves, but I can raise three-quarters of a crop of bush beans, cabbage, or potatoes with no more cultivation than the tomatoes require alone, or they will be out of the way by the time the tomatoes cover the ground. The cultivation can now be done almost entirely by the plough, with the exception of hoeing once or twice directly around the plants. Discard all trellis as worse than useless, as the fruit ripens better lying directly upon the ground. Besides, the plants will continue in bearing longer, as the joints will take root. If the fruit becomes dirty, wipe it off with a damp cloth. This will be found cheaper than erecting trellis. In fact, all labor spent in making vegetables appear well pays better than the labor spent in growing them.

The best variety for market, when we consider earliness, productiveness, and quality, is the Orangefield. It is a variety that I have never seen puffed, but this in no way detracts from its merits. For market we want a tomato of medium size, early, solid, and productive. The Orangefield fills the bill. I am inclined to think well of the Canada Victor after one season's trial, for although it is not as productive as the Orangefield, the bulk of the crop ripens sooner, although specimens of the Orangefield ripen just as soon. For home use the Trophy is superior; for quality it is unexcelled, smooth, and solid. It is too large for market, as the grocer cannot well measure it out by the quart. Besides, it has a bad fault of cracking. Compared to these three varieties I know of no other worth growing. In conclusion I would say that when we consider the number of sashes and labor required in growing the plants and the perishable quality of the vegetable, I do not consider tomatoes a very profitable crop.

SAVING STREET SCRAPINGS.—The best heap of rich fertilizing material that I ever owned was a pile composed of street scrapings and good horse stable manure, evenly proportioned. The first was purchased at a low rate, and embraced every imaginable ingredient that one could think of to turn into plant food. The basis appeared to be about equally proportioned between leaves, kitchen-offal and horse-droppings; and this was placed during the first manipulation in alternate layers with the manure. It was turned and thoroughly incorporated together during the summer, so that by the succeeding spring I never saw such a mass of black unctuous compost as this presented. It went on my flower-beds, my garden and field crops, and I was always under the impression that I never before had such success as this particular autumn returned. The most serious trouble was, not where to apply it; but what should do without a portion, for it seemed just the thing for all; and I shall not soon forget the size of my roses, the color of my Seckel pears, nor my excellent vegetables during that memorable season. Should circumstances prove favorable, I will again be a bidder for a similar bargain in the way of street scrapings. —*Cor. New York Tribune.*

Cutting Potatoes for Sets.

In these days of new and expensive varieties, it is well to know how to make the most of your dollar a pound, or dollar-a-tuber rarity when you have purchased it. It will be recollected that, in a recent competition for prizes offered, over the line, for the largest amount of potatoes grown from a single pound of seed, the astonishing results of 900 and 1,000 to one were claimed to have been attained. An English contemporary gives its idea on how the most may be made of a single tuber. If the potato be noticed, with the stem end down, it will be seen that the eyes are arranged around the tuber in regular ascending rotation from the bottom to the top, similar to the thread



of a corkscrew, each eye being a little above and further round the side than the one next below it. Now take the Potato in the left hand, with the stem end down, keeping it in a perpendicular position throughout the entire cutting. Take a sharp, thin-bladed knife and remove the first eye, by placing the knife about equally distant between it and the eye next in rotation above it, sloping it to the indentation left by the stem (see dotted lines in centre cut), removing the flesh with it. When the first eye is removed turn the Potato around in the hand until the next eye above appears. Remove this one in the same manner, and keep on turning the Potato, removing each eye as it appears in exact rotation, always sloping the knife to the stem.

After three or four eyes are thus removed, the bottom part of the tuber will have a somewhat pyramidal form (see centre cut). It will be noticed that each eye removed has a similar form to that represented by the cut on the left, and has its proportionate share of the flesh attached. After the first two eyes are removed, no further trouble will be found until the seed end is reached, and only a little extra care will be required to remove these closely clustered eyes. The cut on the right represents what remains of the Potato after all but the small eyes are removed, while the dotted lines show how to separate each of these. It will be noticed that the base retains the same form throughout, and by sloping the knife each time, and cutting down to the apex of this inverted pyramid (which is the centre of the tuber), each eye will be supported by an equal amount of the flesh which is to start it into a strong, healthy growth.

It is not claimed that this trouble would pay where potatoes are cheap, and time and labor are scarce; but, with the fancy-priced new varieties, the plan will certainly be worth studying out and practising.

HORSE RADISH FOR MARKET.—A small bed pays handsomely. Of course no one will go into it largely without knowing where he can place his crop. The sets, or trimmed pieces of roots six inches long, are planted in rows, placing them deep enough so the tops are a couple of inches below the surface. When so deep as this, the whole surface may be harrowed several times without disturbing the roots, in fact, the ground kept clean till the tops are too large to allow the use of the harrow. Then the corn cultivator comes into use. So as to get at them in February we dig them in November with the subsoiler and put some in the cellar and some in pits. Sales begin in February and continue till May. Prices for washed roots at the groceries range from seven to ten cents per pound. Grated in bottles it wholesales at twenty-five cents per pint bottle, (half vinegar), and some gardeners find it a profitable way to busy themselves at a dull season,

selling to some single groceries \$20 to \$30 worth in bottles. To make a large growth it needs rich ground, and then a small spot produces a large weight of it. It should all be used at one year old.

Treatment of Small Seeds.

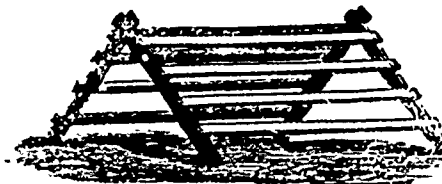
I believe small seeds more frequently fail to germinate after they are sown than large ones. Various reasons might be assigned for this, but I think the principal causes lie in the manner in which small seeds generally are treated, especially those sown in pots and pans. The latter are in most cases filled very loosely with open soil, and rendered extremely porous by the application of large quantities of leaf mould and Mushroom-lung. Upon the surface of this the small seeds are then strowed, and a good watering is forthwith administered. This, undoubtedly, has the effect, in nine cases out of ten, of carrying the greater part of the seeds far down into the open mixture, where they have but the remotest chance of germinating. Should they do so, there is so much length of young and tender stem between the root and the surface of the soil that the young plants damp off before they are many days above the ground. Such failures are seldom attributed to mismanagement, but usually to bad seed.

The plan I have adopted with perfect success is to have the surface of the soil, where the seed is to be placed, composed of the finest-sifted matter, through which the seed will not easily pass. When the seed is sown, I never give a drop of water on the surface, but let the pot or pan into a flat filled with water. The soil soon gets moist, while not a single seed is shifted from the position in which it was originally laid; and I never have occasion to suspect the quality of the seed. The flat is not kept constantly filled, but supplied with water as required, and this should never be given on the surface until the young plants are well up.

There is another practice I have often observed in sowing seeds—that of filling the space between the soil and the rim of the pot so full of water as to flood the seeds, when they are nearly all washed on one side. When these germinate they often come up so thickly as to smother each other, and much damping usually follows. This tends directly to spoil seed and plants; on the other hand, the flat system saves both, and may be successfully practised by all. Those who cannot afford to get a common garden flat may use an old tea saucer with the same practical results. —*Cor. Garden.*

A Tomato-Trellis.

The tomato-trellis, illustrated on this page, is intended for use where tomatoes are grown on a small scale or for home use. Of course, it would not pay to attempt to trellis them where grown on a large scale. The advantages attending the use of the trellis are that the vines are kept



from straggling, the fruit is less liable to rot, and the tomato-worm is easier got at and exterminated. The trellis should be set before the plants are put out so that they can be trained early. The cut is from an old number of the *American Agriculturist*.

PROPAGATING RHUBARB.—In making new beds of rhubarb, separate portions from the old plants, and set out in a bed three feet apart each way. It matters little how small the portions of a plant may be in thus setting out new beds, if each piece has a little of the crown as well as root. The Crown should just show at the top of the soil, and be firmly planted.

TESTING THE VITALITY OF SEEDS.—Nurserymen who have a reputation to lose are continually testing their seeds, so as to avoid the sending out of rubbish. A common way of doing this is to soak the kernels from ten to twenty hours in tepid water; then spread a piece of cloth on some mellow soil in a flower pot, cover the seeds with another piece of cloth, then sprinkle the soil to the depth of one-fourth of an inch over the cloths. Let the pot be kept in a warm place, say on a shelf near some stove in which a fire is kept burning day and night; let the soil be kept moist with tepid water. Large kernels should be planted one inch deep. Some kinds of seed will germinate in from thirty to forty hours, while others that are fresh and pure will not exhibit signs of vitality within several days. By having the seeds between two pieces of damp cloth the kernels can be examined at any time without injuring the germs. A few kernels of seed should be tested before they are planted.

The Breeder and Grazier.

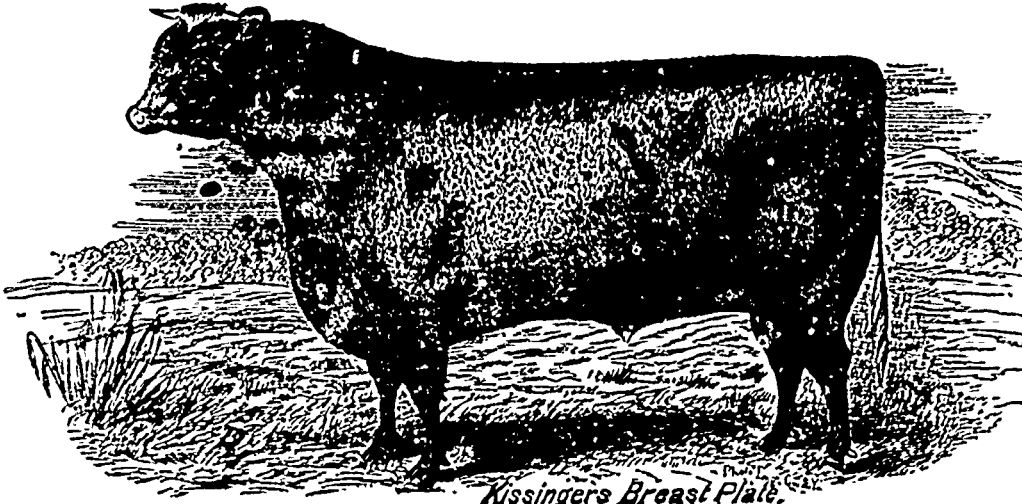
The Judging of Short-Horns.

At a recent meeting of the Penrith, Cumberland, Farmers Club, an essay upon the breeding of Short-horns was read by Mr. George R. Hedley, of Newcastle. We give below, in a condensed form, the portion relating to the judging for the award of prizes:—

In the first place, the true judge would never go very near to his subjects when they were first introduced to him. He would stand quite still at a given point, and see them walk around him in an oblong ring, not too large. He would then quickly, and almost without an effort, draft the worst animals back to their stands. Then he would draw the others up in a line and inspect closely. By this method he (the lecturer) had never seen but what the largest class could in a few minutes be drafted down to four or five. If the number left were very much alike in shape, substance and symmetry, an inspection of the age, quality and sex would soon determine which were to have the first, second and third honors. The correct judge would always bear in mind that a moderately-sized animal, perfectly even, was to be preferred to a much larger one that was uneven, and that no excessive development of one or more parts would compensate for other parts that were dwarfed and meagre. He would also bear in mind that the first essential in a short-horn was a straight back from shoulder to tail. Then when he came to the neck he would also know that the male requires to be thick at the base, that it should taper along the sides, and rise on the top a little towards the head. That of the female should be fine and long, and on a plane with the shoulders and the whole of the back. The side of each animal should be as near the form of the sides of a barrel as possible, the ends of the barrel being the foremost parts of the shoulders and the hindmost parts of the thighs. The legs should not be much crooked, and the head of the male should be strong and massive, covered on the front with long shaggy hair, that of the female tapering, clean and fine. The eyes of both should be prominent, and those of the female very soft and placid. A good judge would always pay deference to thickness of flesh, and there were cases when a little fault in complexion and outline might be overlooked for that great desideratum. The skin in the best breeds would always be found to be soft and springy, moderately thick, and clad with long, bright, silky hair. If there was a doubt about the supremacy of quality, that with the finest hair and most pliable skin along the top of the loins and hooks should be placed first. Any deviation from a gentle curvature in the horn was to be eschewed, and the fashionable color in the horn was yellow and crimson in youth, and white in age. His proclivities went in the direction of strong horns instead of short ones as a mark of constancy, and as to the mouth, he considered it should always be rather large, if it had to feed a capacious frame. Finally, before entering an examining board and the appointment of qualified judges, the lecturer suggested a table of points which he studied for a considerable time, but he has never been able to bring it to a highly satisfactory conclusion, but last year when a table was formed at Kinross, he submitted the following table, 100 points being distributed over the whole of the animal in 26 parts:

PART.	NO. OF POINTS.
1. Nostils—Large and open, and nose end free from thickness or great paleness. Proper color, cream or light tawny.	1
2. Nose—Broad and capacious, not too long.	1
3. Eyes—Large, bright, prominent and placid.	2
4. Skull—Round over the eyes and down to nose end—Tame, clear, and free from brand or blackness.	3

PART.	NO. OF POINTS.
5. Horns—Moderately strong, rather flat, open, evenly bent, yellow in youth, getting white towards age; not much tendency upwards, not blackened, except very slightly, at the tips. Streaks of red not objectionable.	21
6. Ears—Large, thin, rather yellow inside, and very facile.	2
7. Choler or Jewel—Wide across and hanging a moderately deep fold of loose skin.	2
8. Forehead—Full and broad, and in the male clad with long hair.	21
9. Neck—Thick at the base, tapering gradually and growing fine towards the head in the male, a little arched on the top and rough with hair; in the female, clean, tapering long, and upon a plane with the shoulders and back.	21
10. Shoulders—Massive, well clad with muscle and flesh, blades sloping backwards to favor good action, and well-covered shoulder points and fore flanks.	6
11. Crops and Chines—Full, broad, and rather round on the top, and exactly on a plane with the shoulders and loins.	7
12. Loins—Broad, long, and soft from one side to the other, the skin yielding to the touch upon any part of them; thick fleshed, and on a plane with chines and quarters.	7
13. Ribs—Springing well out from the back-bone like part of a hoop, continuing their capacity downwards to the heart, and backwards, extending very nearly up to the hooks.	5
14. Belly—Not small and tucked up, nor bending	5



Short-Horn Bull "KISSINGER'S BREASTPLATE," the Property of HARVEY SODOWSKI, Illinois.

15. Quarters—Long, broad, soft, and level with the loins and tail. There should not be any hollow between the hook and rump end; the whole ought to be regularly covered with soft flesh. The base of the tail should not be any higher than the rumps, and the tail ought to hang at right angles with the back-bone.	8
16. Thighs and Twists—Broad, straight and large, but not protruding out behind, as that denotes coarseness.	7
17. Flanks—Fore flanks should swell outwards and run level into the shoulders. The hind flanks should be deep and full, and on a level with the hips and thighs.	4
18. Chest—Large, and wide across from the bones of the shoulders to the midriff, giving plenty of room to heart and lungs.	7
19. Legs—Fore legs straight, plump and fine. Hind legs nearly straight, wide apart, and fine.	4
20. Brisket—Deep, wide, and protruding forwards.	4
21. Neck Veins—Full and level, and running nearly into the shoulders.	8
22. Touch—Soft, springy and elastic; the skin moderately thick, and capable of being lifted on the top of the loins and over the hooks.	3
23. Hair—Long, fine, thick and bright.	4
24. Color—Any mixture of red and white, namely: Roan, or red with white. A very dark red, or a very light red, or a spotted red and white objectionable. Roan the most preferable, red the next.	5
25. Size—Medium best. Very large beasts do not produce the best beef-making animals, and they require more food.	8

PART.	NO. OF POINTS.
26. Style and Carriage—Should walk straight, with free shoulder action, holding the head high, and presenting a gay and graceful appearance.	4
Total	100

Mr Hedley also produced and read an example of an award paper, to be used when judging; and then proceeded to point out the benefits of his minute description of what he considered a good Short-horn, adding that if correct and adopted, it would be highly educational, and it would call upon judges, at all times, to give a reason for their decisions.

Kissinger's Breastplate.

The Short-horn bull "Kissinger's Breastplate," 17476, of which an illustration is given on this page, was bred by Joseph Scott, Paris, Ky. He was got by Breastplate, 1431, out of imp. Primula by Falstaff (21720), — Polyanthus by Chieftain (21421), — Pristino by Exbridge (13930), — Priscilla by Earl Stanhope (5966), — Perpetua by Master Charley (7125), — Daffodil by Plonipo (4724), — Duchess by Alamodo (725), — Lady Sarah by Childers (1824), — by Wellington (3619), — by Panton Major (6274), — by Waddlingworth (668).

Kissinger's Breastplate is of a dark-red color, stands near the ground, with good even top and bottom lines, and is of great evenness and smoothness. He is two years old and weighs 1800 pounds. He was sold at Dexter Park, Chicago, lately for \$2,200. He was bought by Mr. Edward Hies, for Mr. Harvey Sodowski, of Vermillion Co., Ill.

UTILIZING DISEASED POTATOES—An English correspondent writes—

"Finding that we had a large proportion of diseased as well as a few small potatoes, we washed them together, and boiled them in a copper with only a little water at the bottom. When done, they were put into a potato griddle, which mashed them to a pulp. This was stored in a large stone trough, each layer being treated with a sprinkling of salt; and this, covered over to exclude wet, kept dry and sweet and good for a very long time. A little of this potato paste mixed with wash was found to get the pigs on so rapidly, that we bought up all the diseased potatoes we could, not only those belonging to our men, but many from our neighbors also; and with these, treated as above, and mixed with a little barley meal, we are now forcing on a lot of pigs at a rapid and cheap rate."

POSSIBLY THERE IS NOT IN ENGLAND, says *Bell's Messenger*, another case like the following—The Rev. John Storer has three old Knightley cows, whose ages are 43 years; two, Gallen and Clarence, were bred by Sir Charles Knightly himself; the third, Wine, bred by Earl Spencer, was from a sire and dam bought at the Fawley sale in 1856. They all three had heifer calves (beauties) in 1874, and are all in calf again.

SULPHUR, SALT AND ASHES FOR STOCK.—As a general rule, says a *New England Farmer* correspondent, live stock, when well fed and cared for, will eat only what their system needs, or what appetite craves. When cattle gnaw the boards and shingles from the barn, the hair from each other's sides, and even the ground where soapuds have been emptied, when they eat old boots, bones and woollen rags, in preference to their food, there is something out of sorts with them, and, as a corrective, I have never seen anything equal to plenty of ashes, salt and sulphur. My usual mixture is four quarts of ashes, two quarts of salt, and one-half pound of sulphur. When the stock have occurred colic frequently, I find they need ashes less. I can stop the gnawing of wood by feeding cows, every time. Sulphur is good for the blood as a preventive of disease, and also makes the hair look well. It is also a preventive of mange in swine, and tends to keep their issues open. Sheep that have sulphur frequently will not be troubled with humors, and will never pull each other's wool.

Tying up Cattle.

For twenty-five years, says an *Ohio Farmer* correspondent, I have been interested in, and have experimented on the subject—have used stanchions, bows, neck chains, ropes, and also the various arrangements of the floors, etc., without being satisfied. I became satisfied of one thing, that each cow should have an entirely undisturbed possession of her stall, and never be tied up. To this end, one year ago last fall I overhauled my stables and made stalls 6x12 feet, crossed with sliding gates, thus leaving each cow in undisturbed possession of feed and stall. The thing worked to a charm, except the room, which was not sufficient for my large cows. This fall I overhauled once more and gave the cows 7x12 feet, not including manger, and am perfectly satisfied with the result; and I wonder how I, or any one else could for a few dollars' saving—which is no saving at all—the better in a way with only twice the space. When I had the room to put in, I'll build it and make men y at it, and if I do not, money shall not tempt me to go back to the old way. I think my arrangement an excellent one, and cheap, can stand four eyes as quick as I can to one.

Way Cattle Require Salt.

We know why the animal craves salt, and why it ultimately falls into disease if salt is for a time withheld. Upwards of half the saline matter of the blood (57 per cent.) consists of common salt; and as this is partly discharged every day through the skin and kidneys, the necessity of continued supplies of it to the body becomes sufficiently obvious. The bile also contains soda as a special and indispensable constituent, and so do all the cartilages of the body. Therefore, if the supply of salt be stinted, neither will the bile be able properly to assist the digestion, nor the cartilages be built up again as they naturally waste.

And when we consider it to be a fact that without salt man would miserably perish; as among horrible punishments entailing certain death, that of feeding culprits on saltless food is said to have prevailed in barbarous times we may become partially convinced, at least of the necessity of feeding salt to our stock—that it is one of the necessities as well as one of the luxuries of life for man and beast; and it should be profusely provided at short intervals, in proper places, if it can not be kept by them continually, so that each and every animal may satisfy the demands of his nature. Then it shall not be said of us that while our pudding is well seasoned and salted, our stock are allowed to suffer for want of the same ingredient, which is as truly necessary for their food as for ours. — *Edw. Johnson.*

Economic Horse Management.

(Continued from last month.)

Long before chemistry and physiology rested upon any definite principles, experience had taught that certain foods possessed special feeding value. These sciences now enable us not only to say which foods are most likely to be useful for any given purpose, but why they are useful in fact they enable us with considerable precision to state the exact comparative value of the various feeding materials. Food may be defined as a material which, when taken into an animal body, is capable of being changed and fitted to build up or replace the tissues of the body. Chemistry tells us that these tissues consist of nitrogenous, fatty, and saline matters. It also tells us that foods present a similar composition; so that, if we know the proportion of these constituents in any food, we shall have a fair idea of its feeding value. But chemistry alone is not reliable, as these constituents are not always in a form capable of being digested, and here physiology comes to our aid, telling us what is and what is not digestible, and also showing us how, under certain circumstances, some constituents are more essential than others. The similarity of composition between animal and vegetable bodies will perhaps be more apparent by a glance at the following tables:

	Composition of Dry Muscle.	Dry Blood.	Dry Vegetables.
Carbon	51.893	51.965	53.46
Hydrogen	7.590	7.330	7.13
Oxygen	19.127	19.115	23.37
Nitrogen	17.160	17.175	16.04
Ash or salts	4.230	4.415	—
	100.000	100.000	100.00

This table shows very clearly, from a chemical point of view, how closely animal and vegetable substances resemble each other. The body does not, however, appropriate the constituents of plants in the elementary form here given. These ultimate elements are, in the plant, combined in various proximate forms, suitable for the nourishment of the animal. In the following tables we show the comparative composition of animal and vegetable bodies in

those more complex forms, and you will notice that again the comparison is very similar:

PROXIMATE CONSTITUENTS OF	
ANIMAL BODIES.	VEGETABLE BODIES.
Water.	Water.
Nitrogenous Matter—	Nitrogenous Matter—
Fibrine (flesh)	Gluten (oats, maize, &c.)
Caseine (milk)	Legumin (beans, peas, &c.)
Albumen (eggs)	Fatty Matters—
Fatty Matters.	Starch, gum, and sugar.
Saline Matters—	Saline Matters—
Lime	Lime
Potass	Potass
Soda	Soda } Ash.
Iron	Iron }

We learn from this table that, in addition to water, the constituents of both animal and vegetable substances may be arranged in three great classes. The nitrogenous matter of the animal body is found under three forms, varying to a certain extent in its properties, in accordance with its derivation from flesh, milk, or eggs; but these three forms are similar in composition with each other and with the nitrogenous matter derived from plants, and all or any one of them taken into the body of an animal is capable of supplying all the three varieties. The gluten of oats, barley, and maize, or the legumin of beans, peas, and tares, supplies to the herbivora forms of nitrogenous matter as suitable and as valuable as the flesh, milk, or eggs consumed by the omnivora. The fatty matters of the body are not derived from the vegetable foods quite so directly as the nitrogenous. We find that animals make large quantities of fat when fed upon vegetables containing but a very small percentage of this article. The explanation of this is, that vegetables, as the table shows, contain ingredients—starch, gum, and sugar—which do not retain their original properties when taken into the animal body. These substances undergo chemical changes which convert the starch and gum into sugar, and finally the sugar into fat. These two great classes—nitrogenous and fatty matters—which are found in all animal and vegetable bodies, are what principally interests us in relation to horse feeding.

Remember, then, that the flesh or muscle of the horse is derived entirely from the nitrogenous constituents of vegetables, which we may therefore designate as the flesh-forming matter. The fatty matters are derived from the fatty and starchy constituents of the food, and as the ultimate use of fat in the body seems to be its consumption for the production of animal heat, we may name this class the heat-forming matter. We may just add that the saline matters of the food directly supply the saline matters of the body, and that they are quite as essential as the other two classes, but they are required in smaller quantities, and they exist in more constant proportion in each article than the other two. Of course, the composition of vegetable foods varies, and it is this variation that constitutes the difference in feeding value of each article. The following table gives a fairly correct idea of the constituents of a series of foods:

	Water.	Woody Fibre.	Starch, gum, sugar, and fat.	Nitrogenous matter.	Ash or Saline.
Beans or Peas	14.5	10.0	46.0	26.0	3.5
Barley	13.2	13.7	56.8	13.0	3.3
Oats	11.8	20.8	52.0	12.5	3.0
Maize	13.5	5.0	67.8	12.29	1.24
Hay	14.0	31.0	43.0	5.0	5.0
Carrots	85.7	3.0	9.0	1.5	0.8
		(Gelatine.)			
Flesh	74.0	3.0	3.0	20.0	—

The chief columns to notice here are those showing the proportion of flesh-forming and heat-forming materials, but we must not lose sight of the others, which in some cases considerably affect the value of a food. The large amount of water present in carrots and beef increases the comparative portion of the other articles, all of which are in a dried state. Again, the column showing the amount of woody fibre is important, as this article is indigestible, and therefore almost useless as food. The most important point, however, in the table is this, that each substance differs in composition, some containing a large percentage of fatty or starchy matters, others containing a heavier proportion of nitrogenous matter. This theoretically suggests that some foods are most suitable for the production of muscle, others for the production of fat, and experience fully confirms the correctness of this indication. You will notice, however, that in every case the table shows a higher percentage of starch than nitrogenous matter. This is not because more fat-forming than flesh-forming food is wanted to meet the waste of tissue, but because a very large quantity of fat, starch, and sugar is applied in the body to keep up the animal heat. It is, to speak popularly, not only required for the renovation of the body, but as fuel for the use of the animal machine. To meet this double demand, we find that the vegetable foods are always richest in these elements, and thus we have another illustration of the eternal fitness of things.

(To be Continued.)

How to Catch a Sheep.

There is a right way to do everything. Clumsy catching and handling is always injurious to sheep, and hard on the party doing the work. The injury resulting from improper handling is greater on ewes heavy with lamb, which are about the only class that need to be caught until tagging and shearing time. It wits a sheep to be caught or lifted by the wool; and such a thing should never be done where it can be avoided. A portion of the flock to be caught should be driven into a pen until it is pretty well filled, though not crowded. The party doing the catching should proceed quietly, frightening the sheep as little as possible, and when near enough to the animal he desires to catch, should grasp its hind leg above the hock, when, if a pretty firm grip is held, very little kicking can ensue. Then he should pass the other hand in front of the breast, which gives him every advantage over the animal.

If it is desired to carry the sheep any considerable distance, he should let go the hind leg, and pass the right arm over the back, just behind the shoulders, with the hand under the brisket, when, stooping a little, the sheep is raised on the hip. If these movements are made with precision and celerity, the sheep is off its feet before it is allowed a chance to struggle. An easy way to carry a sheep for a shorter distance is, after lifting it, as above, to take a hind leg with the free hand, which brings the sheep immediately in front, with its back pressed closely against the man. This position will be found quite necessary when the animal is to be lifted over a fence, or into a waggon. If it is desired only to move the animal from one pen to another, it need not be lifted at all, but with the first grip over the hamstring it may be gently drawn backwards to the entrance, and turned with the left hand, before being released. — *National Live Stock Journal.*

FEEDING CARROTS.—Horses relish carrots amazingly in the spring after a long confinement to grain diet. Carrots should be cut in long slices, not crosswise, then there is no danger of a too eager animal getting choked. At first, carrots will act as diuretic and laxative; afterwards these effects pass off. It is claimed that carrots are good for the wind and that they produce a fine, silky coat. These effects are due only to the fact, that they restore a proper tone to the body, and thus are conducive to health.

BREEDING SEXES AT WILL.—E. L. Davison, an experienced Short-Horn breeder, gives the *Kentucky Live Stock Record* his conclusion that all the theories in regard to regulating the sexes in stock-breeding are unreliable, no having tried all of which he has heard. In a series of generations he thinks the number of each sex produced is about equal. He states the interesting fact that his oval, Weehauken, now thirteen years old, has produced fifty per cent. more heifer calves in the last eighteen months than ever before in the same time from the same number of cows.

CASTRATING LAMBS.—Lambs should be castrated when between twelve and twenty days old. It should not be done in frosty or rainy weather, and the lambs should not be heated by being driven. A clean incision should be made in the scrotum, first to one testicle, then to the other. The testicles should then be withdrawn, and the spermatic cord severed with a knife that is not sharp. If too clean a cut is made, the bleeding is apt to be profuse. There is no necessity for using the teeth in this operation. An adroit operator will have very few casualties. The wound should be examined to see if inflammation has set in. If suppuration has ensued, the matter should be discharged, and the wound is soon healed.

TO PREVENT SOWS FROM EATING THEIR YOUNG.—Says a correspondent of the *National Live Stock Journal*:—I have a very fine imported Berkshire sow, which now has her third litter of pigs; she is an excellent breeder, and I have given her the best of care, but lately she has taken to eating her pigs, and destroyed four of them in a very short time. They were but two weeks old, and I preferred leaving them with their dam; and in order that they might escape death, in the manner above mentioned, I took some coal oil, and with a small sponge applied it to their hair, being careful not to get any in their eyes; gave an application once a day for several days, and she has never molested a single one of them since in the least. I think the coal-oil is a sure preventive.

WORKING BARREN COWS.—An experienced Kentucky breeder, Mr. Vanmeter, writes to the *Live Stock Record* giving the results of his treatment of cows that had been deemed to be hopelessly barren. This specific as a remedy for barrenness is—work. At the famous New York Mills herd sale he purchased, for an old song—\$100—the Duchess of Thorndale, then deemed hopelessly barren, as she had not produced a calf for three years. His mode of management is simply to reduce the flesh without producing inflammation. Starving the animal he thinks injurious, and adopts the plan of giving severe exercise with only moderate feeding. In most cases he works the supposed barren cow under the yoke. In the case of the third Duchess of Thorndale, he had her led or ridden four miles daily, and fed on a limited quantity of hay and fodder. She is now in calf.

Veterinary.

Cow with In-Growing Horn.

EDITOR CANADA FARMER:—For some time past, I have been greatly troubled by a valuable cow whose left horn has a tendency to turn and grow into the side of her head to such an extent that I have had to cut the end off twice to prevent it from putting out her eye and otherwise disfiguring her head. If some of the readers of the FARMER could tell me how to prevent its unnatural growth, it might not only be of benefit to me, but also to some other of your subscribers.

Mara, Ont

X Y P

We do not know that anything can be done, except to cut off the end of the horn, from time to time, as it becomes troublesome.

Period of Gestation in Mares.

EDITOR CANADA FARMER:—Can you inform me how long a mare carries her foal? Also if one week's rest before and after dropping her foal is sufficient?

J. M.

The average period of gestation in mares is eleven months. It may vary, however, two or three weeks on either side of that period.

One week's rest after dropping her foal is not sufficient. Previous to the birth, she will be all the better if she perform light work up to a few days of her foaling. Care must be taken not to overload her, or put her to work requiring a sudden strain.

Inflammation of the Udder

EDITOR CANADA FARMER:—One of my cows has been for a long time subject to lumps and clear blood in the udder, rendering the milk unfit for use. Can you tell me the cure and preventive?

K Y P

Probably inflammation of the udder is what is the matter. Give a pound of epsom salts in a quart of sweetened water or linseed gruel, afterwards a teaspoonful of saltpetre three times a day. Foment the udder with warm water daily, and afterwards rub in a liniment composed of tincture of camphor, two ounces, and tincture of arnica three ounces. If but one quarter of the udder is affected, it will be best to let it dry. If the affection is the result of a kick or other injury, nature will heal it in due time.

Diseases of the Digestive Organs of the Horse.

At a meeting, last month, of the Veterinary Medical Association, held in connection with the examination of the students of the Ontario Veterinary College, at Toronto, Mr. E. T. Hagyard read a paper on the "Diseases of the Digestive Organs of the Horse." The paper, which is an able and practical one, has been handed to the CANADA FARMER for publication. The subject treated comprises a class of diseases very common, probably the most numerous that a country practitioner has to treat. Mr. Hagyard proceeds thus:

I do not propose to treat in detail all the diseases to which the digestive organs are liable, but will consider some of the most important—those with which I think the young practitioner will have the most difficulty.

We will commence with Stomach Stagers, or Acute Indigestion, the cause of which is over-feeding, producing distension of the stomach and interruption of the digestive process. It often occurs among horses that have been worked hard for some hours, and fed largely afterward; two or three hours afterward—while at work, probably, the horse suddenly stops, evinces pain and colicky symptoms. The digestive process being stopped, the contents of the stomach undergo chemical change, evolve gas, and the belly becomes flatulent, the pain and distress increase with the flatulency, and, if not relieved, terminate in inflammation of the bowels, which runs its course with fearful rapidity. Occasionally the stomach ruptures, when there is almost immediately a cessation of the acute pain, but the distress increases, the pulse becomes imperceptible, there are tremors of the body, and frequent retching and attempts to vomit, and death results in a few hours.

Inquiry into the cause of the disease is seldom satisfactory, as, in these cases, few will admit carelessness in feeding, for fear of blame. The practitioner must therefore exercise his judgment as carefully as possible as to the nature and quantity of the food the horse has taken. The treatment must be prompt and energetic. If the pulse is not much quickened, except during a severe paroxysm of pain, and if there is not much flatulency, probably the whole treatment required will be a brisk purgative, say:—Aloes, 1 oz.; Potass. Subcarb., 1 drachm, or Calomel, 1 drachm, or Linseed Oil, two pints, and oil of turpentine, two ounces, if there is much flatulency. Stimulants, such as ammonia, must be used. Injections of the turpentine may be used at intervals, or tobacco smoke. If the pain is intense, opium may be used in combination with the purgative and stimulant, but as it is calculated to retard the action of the purgative in some measure, it is not advisable to use it unless the intensity of the pain demands it.

There is another form of this disease, which mostly occurs in the fall and winter months. In my practice it has been unusually prevalent this winter. In the fall, after the farmer completes his fall work, he will suddenly change the diet of his horses from oats and hay to cut straw, pea-straw, or, in fact, any coarse, indigestible food the horse will eat, will be used to put them through the winter. Such food, in the generality of horses, soon produces indigestion. The disease is of a chronic or sub-acute character, and will continue for some days, or until the stomach and bowels are evacuated by purgatives. A change of diet is essential, and should be insisted on. Soft, easily-digested food should be used until the bowels are evacuated. In the intervals between the paroxysms of pain, the horse will often be eager for food, and I have known frequently a few mouthfuls of hay bring on a paroxysm in a few minutes. The disease is not of a fatal character. Purgatives used in the first place, continued with mild stimulants, and, if the pain is severe, with opiates, will generally effect a cure. The unfavorable termination of the disease is constipation of the bowels which is occasionally obstinate, and must be treated in the usual manner, with purgatives, injections, &c. A stimulating embrocation to the surface of the abdomen may also be used during the attacks of pain with benefit.

The next disease to which the digestive organs are frequently liable, and which the practitioner has very often to treat, is spasmodic and flatulent colic; but, however, as the causes, symptoms and treatment of this disease are so well known, and, I think, understood, we had better proceed to the consideration of a disease to which an attack of colic is often the precursor, viz.: Enteritis. The surgeon may be called upon to treat a horse that has for some time presented the ordinary symptoms of colic, perhaps may have been driven some miles, or worked an hour or two, hoping the disease would disappear, as is sometimes the case: or after having the usual nostrums prescribed by the owner or others. The pain continues, or returns at short intervals. Small portions of dung are voided, increasing tenderness of the abdomen, and carefulness in lying down is observed. The pulse gradually rises in frequency, or has perhaps reached eighty to a hundred, but is still full and distinct. This is evidently the intermediate stage between Colic and Enteritis, or, in all likelihood, the inflammatory action will have commenced.

In none of the diseases of these organs to which the horse is liable is more energetic and prompt treatment required than in this. Thirty-five years ago, at the time I studied at the Edinburgh College, the anti-phlogistic treatment by bleeding was carried out to its fullest extent. That practice in veterinary as well as in human practice, has been nearly, if not altogether, abandoned—and happily so. I am quite of opinion that in no disease is it more essential to sustain the vital powers than in the one now under consideration, and I have been long convinced that, if by bleeding the pulse is so much lowered as to become imperceptible, we induce by that treatment the first stage of a fatal collapse.

My practice in these cases is—once to give powerful opiates, say tincture of opium, two ounces; and, if the pulse is full and strong, I add to it fifteen or twenty minims of tincture of aconite. In an hour, if there is no relief, I repeat the dose, or I give a favorite prescription of mine: physic mass, one ounce and a half to two ounces, powdered

opium, one to two drachms, calomel, two scruples. Injections are necessary to empty the rectum, and may be repeated with the addition of an anodyne, stimulating applications or hot cloths being applied to the abdomen, but the grand object to be attained is, to get the patient under the influence of the narcotic as soon as possible. If that can be effected, and the animal lay quiet and free from pain for an hour or two, in all probability its recovery is assured. If, on the contrary, the pain continues, the pulse becomes imperceptible, patches of cold sweat over the body with tremors, effusion or exudation of blood have commenced, it is then the usual practice to resort to powerful stimulants—a forlorn hope, as I cannot say that I have yet seen a case recover where these symptoms of collapse have taken place.

Enteritis may occur from other causes: super-purgation, over-exertion or exposure, or may be complicated with other diseases. A few years ago, I had several cases from exposure late in the fall of the year, assisted a good deal by coarse and perhaps frozen herbage, which only is to be got outside at that season of the year. These cases did not present acute Enteritic symptoms, and post mortem examination presented extensive peritoneal inflammation, as well as intestinal and serous effusions. The most successful treatment was opiates with stimulants, mild laxatives, followed by tonics and diuretics.

Lump in Cow's Teat.

EDITOR CANADA FARMER:—I have a heifer which, this spring, after having her second calf, took a swelling in her udder. It settled in two small lumps, about the size of nutmegs, at the root of the two rear teats. In milking, they sink about half way down the teat, and prevent the milk from passing. It is about a month since she calved. Could you or any of your readers give me a remedy? She is a first-class milker, and I would not like to sell her.

A YOUNG FARMER.

Hope, Ont

These swellings, which are frequent attendants upon the first calving, are usually thickenings of the membrane which lines the teats. Sometimes also they arise from roughness in milking. The removal is difficult, and if it were only one teat that was affected, it would be best to let it dry off, as the closing of one teat does not often diminish the supply of milk, the others becoming more productive. The manner of treatment is to pass up a test-bistoury and cut the obstruction. A silver syphon is then inserted, and either left permanently, or is used as often as is needed to draw off the milk.

Paralysis of the Hind-Quarters.

Big cows in poor condition, and pulled down by the carrying and nourishment of one, or perhaps two calves, are apt, both before and after calving, to have the ligaments of the pelvis so relaxed, and probably also the muscles of the back and limbs so weakened, that they have difficulty in getting up, find standing weariness of the flesh, and squat themselves, with their hind limbs tucked under them, resting comfortably on their broad breast bone. In this position they will remain sometimes for many days, making no effort to rise, eating and drinking with their usual zest, the chief trouble with them being to take care that the limbs do not get chafed or unduly pressed on with lying, and that the udder is kept emptied of its contents.

Have a comfortable bed made with abundance of short straw, turn the cow from one side to the other twice daily, to prevent any undue pressure on the limbs or udder. Every two or three days endeavour, with several willing hands, to get her on her legs, for often a cow, having vainly tried to get up, continues to lie for many days after she is quite able to rise and stand. If the limbs get cold, rub them well several times daily. The bowels are apt, in some such cases, to become torpid, and this must be guarded against by the use of sloppy, laxative food, thin linseed gruel, or treacle and water, and if need be, by a dose of physic.

If calving is near, restrict the amount of dry and stimulating food given, and get the udder to take on, if possible, its secreting duties by drawing away as much milk as can be got night and morning. So long as the cow remains brisk, her nose bedewed with its natural moisture, her pulse, breathing and temperature natural, there is nothing to fear in her continuing to lie.—North British Agriculturalist.

The Poultry Yard.

Cost of Keeping Breeds for Market, Non-House, Etc.

EDITOR CANADA FARMER:—Would you or some of your correspondents give me what information you can on the keeping of a hen-dairy? And what it would cost to keep three hundred hens for a year in the country where a farmer can raise his own grain? What kind of grain is best for fowls? What breed of hens is best for market when fattened and killed? And what breed is best for laying eggs? What kind of a house should I build for the hens, and what size? and what the size of a yard for them to run in? Would eight feet high be sufficient for the fence? Any suggestion on the above would be thankfully received by one who is going into the above business near Brockville this season.

W. G. D.
Brockville, Ont.

To give our correspondent specific information on every point would be somewhat difficult. We shall, however, supply such as we have, and be glad if other correspondents will give us the benefit of any practical knowledge they may be possessed of on this subject.

We know of no establishment in Canada conducted on a scale so extensive as that proposed by our correspondent, although we have several fanciers who breed extensively, but they look to prize taking, the sale of eggs, and stock birds for their remuneration chiefly, and not to the production of eggs and poultry for the market, as our correspondent's letter would lead us to believe is the object he has in view. The quantity of grain consumed by different breeds of fowls varies greatly, the larger breeds consuming much more than the smaller. It would be impossible, therefore, to give even an approximate estimate of the cost of feed; besides which, the diet of fowls must vary in accordance with the purposes for which they are kept. If for laying, grain will form the basis of the dietary scale, varied, of course. Oats, barley, buckwheat, wheat-scraps and Indian corn may all be given, with an occasional morning meal of soft food. Green food, meat and gravel must also be supplied. But if the object is to fatten for table a very different dietary scale will be necessary.

In close connection with this is the very important question, "Which is the best breed of fowls to keep?" If the object of the breeder be to produce table fowls, a colored Dorking cock mated with dark Brahma hens, will produce a large table fowl, but if the production of eggs alone be the purpose of the breeder, then a good Spanish or Minorca cock mated with Brahma hens, will greatly increase the laying qualities of their progeny.

With reference to the best breeds of fowls to be kept, we cannot do better than to quote the following remarks from the "Illustrated Book of Poultry."—"The chief breeds of poultry may, for economic purposes, be classified as follows: the order of naming representing as nearly as possible their average comparative value, though this will vary somewhat according to different circumstances. As layers:—Hamburghs, Minorcas or Andalusians, Houdans, Brahmans, Leghorns, Spanish, Polish, Dominiques, Game, Cochins, La Flèche. For quality of meat:—Game, La Flèche, Dorkings, Crèveceurs, Houdans, Polish, Brahmans, Dominiques. For size and weight: Brahmans, Cochins, Dorkings, Crèveceurs, La Flèche, Malays. For hardiness:—Houdans, Brahmans, Dominiques, Cochins, Minorcas and Andalusians, Leghorns, Game. As sitters and mothers:—Dorkings, Game, Dumpies, Silkies, Dominique, Brahmans, Cochins. We might, perhaps, add, that for combination of useful qualities generally, we would name Brahmans, Houdans and Dominiques as most worthy of attention." In addition to the foregoing, we would advise our correspondent to read over carefully the series of articles under the general heading of "Poultry Notes," published in last year's CANADA FARMER, which will supply much if not all the information sought.

On page 13, vol. X., of the CANADA FARMER will be found Plan of Poultry House, which our correspondent would do well to adopt, inasmuch as it provides for the keeping of different breeds of fowls, as well as different varieties of the same breed, a course which must be pursued if success in poultry breeding is to be obtained. To keep so large a number of fowls great care and attention must be paid to diet and cleanliness—subjects on

which a small volume might be written—as well as to proper mating, killing off at the precise period when the greatest profit at the smallest cost is obtained, all of which requires a practical knowledge of poultry keeping. Would it not be well for our correspondent to begin on a smaller scale, and then gradually increase?

Leghorns.

EDITOR CANADA FARMER:—I have read everything that I could get at for the last year about poultry, in search of a good breed of hens for laying. My selection is Leghorns. I have a store-house half under ground on the side of a hill, facing the south and well-sheltered from the west winds by other buildings. I calculate to keep them in an ordinary-sized yard. I have good facilities for careful management. Can you inform me of any better kind than the Leghorns, or would you advise them?

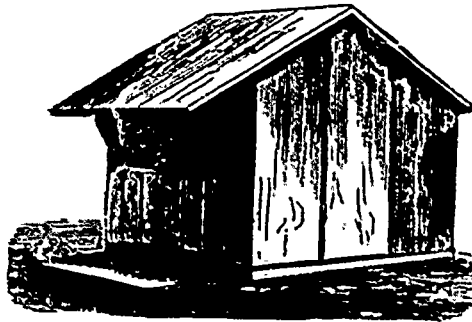
Mount Healey, Ont.

J. E.

Leghorns are an excellent herd of fowls to keep. They are, however, of the non-sitting class. A few hens of another breed will therefore be required for hatching. The large combs and wattles of Leghorns render them, like the Spanish, very susceptible to injury by frost during the winter season. A warm comfortable home is therefore a necessity to secure success. The house described will suit well enough, provided there is sufficient light and ventilation. The ventilator should be in the roof, if possible, and so situated as to avoid draft where the roosts are placed. There should be a window in the south side of the fowl-house to admit the heat of the sun during the day. The health and well-being of fowls are greatly increased by the free admission of the sun's rays.

An English Hen-Coop.

The English breeder who recommends the pattern of hen-coop depicted on this page, Mr. T. C. Burnell, says of it:—It combines every requisite for rearing chickens successfully, and with it no shed or coop-house is required. It also possesses the merit of being vermin-proof when shut up, and this, too, without the ventilation being at all impeded. Most hen-coops are entirely inadmissible for outdoor chicken-rearing for two reasons:—one, that the wet drives into the front of the coop; the other, that in heavy rain the wet runs in underneath the sides. In this model coop both these disadvantages are avoided, as the roof projects over the open front, and effectually keeps out the



rain; while a wooden tray is made to fit inside (which should be always kept filled with sand or dry earth), which entirely keeps the little chickens out of the wet. The flap-door, which in the wood cut is seen lying on the ground, hinges at bottom on hooks, and when turned up and secured with a button, fastens the coop up for the night, secure against fox or rat. The top part of the open front is made of small-mesh wire, and should be placed perpendicularly, and not be made, as in the drawing, to lean forward. This, besides giving light and ventilation, will be found convenient for feeding the chickens through on a very inclement morning when it is not desirable to let them run out at once.

CHARACTERISTICS OF A BLUE TURBIT.—The standard characteristics of a Blue Turbit I consider to be as follows: A short broad head; beak also short, in fact, the shorter the better. A crown or crest behind the head should taper to a point, if the Turbit is what is termed a point or peak crested bird; but if a shell crested Turbit, the crown or shell should be spread out the whole width of the back of the head. The purple or tuft of feathers on the breast should open and turn back both ways, something like the frill of a shirt; the larger and more conspicuous the purple the greater the value of the bird. The thighs should be quite clean, i. e., not the slightest shade of blue or any other color

except white on them, the wings should be blue, with two narrow black bars across each, brown or rusty feathers are a serious defect; each wing should have ten white flight feathers. The breast underparts, flight feathers, tail, and back, should be white, and quite free from any colored feathers. Both cock and hen should be rather small, and the cock should have a nice gloss around the neck.—F. H., in *Journal of Horticulture*.

MENTION IS MADE in *The Fancier's Gazette*, London, of numerous instances where the crops of poultry were opened and cleaned without injury to the birds. Once in Scotland one of several ducks swallowed a thimble dropped by a "kilt-builder," whereupon not knowing which duck had it, he caught the one nearest at hand, cut and turned its crop out; it wasn't there, and he sewed it up; then he caught another, and secured his property, after which surgeon and subjects went about their business as though nothing unusual had happened.

The Apiary.

The Senses of Bees.

The senses of bees were the next subject of investigation, and we will give, in brief, the results which Huber reached. The lenses of the bees' eyes are not adjustable; and, though they can see accurately to great distances, they seem blind to objects close by. Bees dart down to the door of their hives with a precision which is generally unerring; but if, from any cause, they miss the opening, they are obliged to rise in the air, in order to take another observation.

If beeshear—which is a doubtful question, the old-fashioned "tanging" to the contrary—they certainly hear only what affects their welfare. Their sense of taste is also far from perfect, foul ditch-water being often preferred by them to limpid streams, or even dew, and ill-smelling plants having quite as much attraction as sweet ones; it is the quantity, rather than the quality of their food, for which they care. They are also fond of the secretions of the aphides, the milch-cattle of the ants.

Their sense of smell is very keen; the presence of honey they detect even in the most carefully-concealed places. Honey-bees often, in scarce seasons, attack the bumblebees on their return from fields laden with honey, and force them to disgorge all they have collected. Its presence in the honey-bag must have been detected by the sense of smell. The seat of this sense is in the mouth; this Huber determined by presenting successively to all parts of the body, on camel's-hair pencils, odors especially repugnant to them. When held near the mouth, the bee started back as if annoyed. On one occasion he mixed honey with camphor, which they especially dislike; they managed to separate and remove all the honey, leaving the camphor untouched.

The sense which seems to be most perfect in these little creatures is that of touch, and that seems to reside wholly in the antennae. Greetings, caresses, and the communication of intentions, are always effected by one bee toward another, by crossing their antennae. It must be remembered that no light enters a hive under ordinary circumstances. "The bee," says Huber, "constructs its comb in darkness; it pours its honey into the magazines, feeds its young, judges of their age and necessities, recognizes its queen, all by aid of its antennae, which are much less adapted for becoming acquainted with objects than our hands. Therefore, shall we not grant to this sense modifications and perfections unknown to the touch of man?"—From "Sketch of Huber," in *Popular Science Monthly*.

THREE THOUSAND and six hundred workers will fill a quart measure.

WORKERS ALONE have the property of secreting wax. Scales of it ranged in pairs are contained in minute receptacles under the lower segments of the abdomen. This substance is produced by a particular organ, after the manner of other secretions.—Huber.

BEES ON A SMALL SCALE.—There are many householders whose means will not enable them to buy a cow, or provide keeping for her, were they in possession of one. But they may be equal to the purchase of a colony of bees and provide hives for the swarms resulting therefrom. Bees, like other stock, require pasturage, but, unlike horse, cattle, and sheep, they are free commoners, ranging at will in search of stores, nor can they be arrested and punished for their intrusion upon premises alien to their owners. A single colony of bees, in good condition in the spring, may be counted upon to double or treble their numbers in a single season, securing ample stores for winter consumption, while supplying a gratifying surplus each autumn for household uses. This accumulation will prove most acceptable in families, especially while the price of butter rules so high as to place it beyond the reach of those not blessed with elongated and plethoric purses. Try a colony of bees as an experiment.—Farmers' Union.

The Dairy.

The Fourth Stomach:

The professors of the Pennsylvania State Experimental Farm have been making experiments to verify the generally-understood belief that finely divided food passes direct to the fourth stomach of the cow. They report that they fed three quarts of corn-meal and three quarts of unground oats to a large cow, which was killed immediately after eating. The following was found to be the case:—

The gullet or oesophagus empties into the paucum, or first stomach, at its connection with the honey comb, or second stomach, and food might readily pass into either of them. The second stomach connects with the manuplus, or third stomach, and empties into a channel that might allow food to pass on to the fourth, or digestive stomach, without passing through the folds of the manuplus. In the case under investigation, the meal and oats had evidently passed into the second stomach, and there undergone a separation, the unground oats being thrown back into the first stomach, the meal passing into the third and through the before-mentioned channel into the fourth stomach, where they found a part of it, and the rest on its way to that point.

They found no meal either in the first stomach or among the manuplus, and from the evidences presented, concluded that meal, fed either alone or mixed, would probably pass directly to the fourth stomach, and that, therefore, those organs can not be ejected out of their proper duty by any artifice, and that meal, fed in any way, will probably pass to the fourth stomach without re-chewing.

Some of the Causes of Garget.

Garget is a disease that appears most frequently at the extreme of the milking season. It appears oftener in spring than fall.

Garget is a hardening of the substance of the udder arising from inflammation consequent upon obstruction in its tubes or tissues; inflammation may precede and be the cause of the obstruction and the hardening, or they come from external injury. The udder is divided into four distinct parts, connected only by membranous filaments, so that an affection of one part does not necessarily involve the rest.

Inflammation is a frequent cause of garget in heifers previous to birth, and preparatory to the active secretion of milk, there is, as every dairyman knows, a determination of blood to the udder, swelling its blood vessels and tissues, and rapidly enlarging the whole mass. In this engorgement of blood, if there is anything in the way of free circulation, stoppages are easily made. To guard against any unnatural interruption in the circulation at such a time, it is important that the blood should be thin and in its natural condition, and that the udder should be free from external pressure or violence. In heifers this enlargement is not as easily effected as in older cows, and obstructions are more likely to happen at the first birth than afterward.

To keep down the tendency to inflammation and hardening of the udder, heating food like corn-meal should be avoided, or fed sparingly, if at all, to heifers. Nor is it advisable food for old cows at this time. A little oil-meal, rye bran or rye meal, may with advantage form part of the food before coming in. They act upon the glandular system, and by their relaxing tendency help to make the circulation free and easy. The refuse of the flouring mill and green food of any kind are excellent for all milk stock at this period.

In cows that have been milked, garget frequently arises from leaving curdled milk in the bags when drying them off in the fall or winter. Milk left in the udder too long when cows are dried off, becomes feverish, curdles, and thus up the milk tubes. The udder, or so much as is thus treated, swells up at once, becomes inflamed, and sometimes the inflammation does not subside before the cow starts again in the spring. This often results in a case of incurable garget, and a loss of one-quarter or more of the bag. If the inflammation subsides, leaving slugs of clotted milk, they will be in the way when the new milk comes again, and clogging up the tubes, will give rise to a new inflammation and more curdling, and a case of garget, less severe perhaps than that instanced above, will take place,

but not without danger of spoiling the part involved. Great care, when drying off cows, is necessary to prevent inflammation of the bag, and consequent thickening of the milk. The time from one milking to another should not be so long as to give rise to any extra warmth or swelling of the bag. If either of these symptoms appear, daily milking should follow till they entirely subside. I have observed more cases of garget and loss of teats from carelessness in the hot in drying off cows than from all other causes combined. If the milk should chance to become thick, it must be worked out. It will not come away readily by milking in the usual way, the bag should be rubbed, or manipulated till it is all worked out.

Bringing the bags when cows are giving milk is another cause of garget. Inflammatory action, whether local or general, causes milk to curdle. Where a cow's bag is heated so that the bruised part becomes inflamed, the milk which is in contact with the inflamed part soon coagulates and stops the passage, which is more easily done by reason of the swelling of the inflamed part.

Garget often occurs in seasons of drouth. When water becomes scarce, so that the herd cannot get a full supply, the cows, especially those giving large messes, soon become feverish and the udder feels the feverishness even more than the rest of the animal. From the deficiency of the water, the blood becomes less fluid than usual, augmenting the difficulty. In the elaboration of milk the substance of the milk glands is decomposed, and under a state of inflammation the work is imperfectly done, the minute vessels at the extremity of the milk tubes become clogged, the elaboration of the milk is checked, the inflammatory action is again aggravated, and the bag, by the engorgement of blood is hardened into a case of severe garget. Cases of this kind are most likely to occur with large udders and those with fleshy udders. Under all circumstances, cows with large, fleshy udders are the most liable to attacks of garget.

A full supply of water is of course the preventive of cases like the above, and is about as good an agent to remedy them when they occur as anything that can be prescribed.

There are various other causes that contribute to the hardening of the udder, such as irregularity of milking, worrying the cows, especially when their bags are full, feeding with an excess of heating food, &c., which need not be mentioned here particularly.

The farmer who fully appreciates how much better prevention is than cure, will seldom have occasion to use a remedy. But cases will sometimes occur, and when they do, the relief may be afforded by proper treatment.

Cases which are not very severe, washing the bag two or three times a day with water will be sufficient. Many recommend cold water, but warm is much better. Cold water will produce, by reaction, a rush of blood to the parts affected, and counteract, in part, its efficiency. Warm water will at any time reduce inflammation, by an external application, more rapidly than cold. If the bag is milked out clean, this treatment will generally be sufficient.

In severe cases, internal remedies may accompany the bathing. Take rock, grated and given in a mass of feed, is the common prescription, and though I can see no reason for its producing any specific effect, it does often act like a charm, and what seems equally strange, cows troubled with garget often show an appetite for it, though they would reject it at other times. Dose, bulk of half a hen's egg. Half an ounce of saltpeter morning and evening, dissolved in the water she drinks, will often render essential aid. When the case is so severe as to need internal remedies, the bags, besides being washed morning and evening with warm water, may be bathed in the middle of the day with liquor of ammonia diluted with some light oil like oil of turpentine, and well rubbed in. This will help to dissolve and scatter out obstructing matter. In such a case the patient should be kept in a comfortable stable and highly fed with laxative food.

This is the best course of treatment known to the writer. Perhaps some one else may give better directions. It is essential to treat garget on its first appearance. If allowed to run, it is liable to terminate in ulceration, which, when once fully established, I have never been able to heal.—*L. H. Arnold, in Live Stock Journal.*

Against Hogs' Rennets.

The stomach of the pig, we see, is being recommended as the strongest and best for cheese making, experience having proved, it is said, that hogs' rennets are superior to calves' rennets in the cheese making art. Now, it has long been known that the stomachs of different animals, and even their intestines, when steeped in water, and used in the ordinary way like calves' rennet, will coagulate milk. But we very much doubt whether any experience has demonstrated that better cheese can be made by using hogs' rennet than calves' rennet—at least no such fact has been proved, that we are aware of, in the markets of the world.

The hog is an omnivorous animal, feeding upon all sorts of dirty garbage, and the idea of using a steeped portion of this repulsive of him and nastiness in milk for cheese making is not a pleasing thought. Again, the hog is liable to many diseases, and from his general care and treatment is perhaps more the subject of disease than any

animal whose meat is employed for human food. These latter considerations alone would be sufficient to exclude hogs' rennets from dairy practice.

We should be sorry to see the introduction of hogs' rennets upon the market. Great losses have been sustained in cheese making by the use of calves' rennets taken from diseased calves, and also on account of tainted rennets, the result of neglect of, or improper care in curing; and if we are to have an introduction of hogs' rennets, under the impression that they are stronger and better than calves' rennets, serious losses will be entailed upon the dairy interest. The advice, therefore, in regard to the use of hogs' rennets, we regard as injudicious.—*Rural New Yorker.*

A Description of a Cow's Udder.

The udder of the cow is composed of four glands. Each gland consists of secreting vesicles, ducts, reservoirs and connective matter. The reservoirs are situated mostly at the periphery and apex of the gland, and more particularly adjacent to the sides covered by the skin of the animal. The secreting surfaces principally occupy the centre. The vesicles in their arrangement form groups, and each group has its duct, which connects with the duct from other groups, and thus the secretion is passed toward the main ducts, which serve to store and transmit what they may receive. These vesicles are lined with what have been called secreting cells, which are really but a stage of development of the butter globule itself. These cells grow by a species of budding or proliferation, and at the same time a species of fatty degeneration may take place to a certain extent until the cell is cast off a milk globule, and is free from the animal structure—is a free cell.

The milk globule is consequently formed from the animal, may more, was up to the moment of separation a portion of the animal, subjected to whatsoever changes may have been impressed upon it by its position, and subject equally with the animal to the conditions of the animal environment in so far as they are applicable. In the early stages of lactation, and before parturition, the process of the casting forth of these milk cells is not so complete as at a later date. We find an excess of action, through which the cells are prematurely cast off; indeed, even when they are in contact with each other. These groups of cells, the lining of the vesicles, and not yet fully transformed into the true globule, we call colostrum corpuscles. Even in animals in advanced lactation these colostrum corpuscles may appear in derangements or diseases affecting the cow, and whose influence extends to the udder. In the colostrum corpuscles we have presented a stage in the development of the globule, where the globules are in aggregation.—*E. L. Sturtevant in New York Herald.*

THE DOGS.—X. A. Willard, says he has known the simple employment of a dog on dairy farms to decrease the yield of cheese per cow nearly 100 pounds per annum.

SCALDING MILK.—J. J. Ellsworth, a well-known dairyman of Barre, Mass., writes:—We have tried scalding milk at different temperatures, but have settled upon 130° Fahr. as being the best temperature; 150° Fahr. would make the cream and butter taste "scald"; less than 130° Fahr. does not destroy the germ of putrefaction. The scalding should be done immediately after drawing the milk from the cow.

SOME POINTS IN BUTTER-MAKING.—It is time to skim when the fingers can be drawn through the top without having the cream close behind it. When cream will do this it is about ripe enough to churn. When cream foams in the churn it may be cured by warming. Cream should not be churned as soon as taken from the milk. It should be stirred together and allowed to ripen all alike. This will occur in twelve hours or so. But cream should not stand until whey is formed in the cream jar.

EAR MARKS OF BUTTER COWS.—At recent meetings of Dairy-men's Associations, in the Eastern States, experienced dairymen said they attached much importance to the color of the inside of the ear of a cow as a test of her butter-producing ability. A rich yellow color on the inside of the ear, one speaker said he had never known to fail as a sign of a good butter cow, one that would give rich milk. Dr. Sturtevant regards the color of the ear a good guide, but calls attention to the necessity, when observing, for clearing away the secretions that may have accumulated on the skin and which may be darker than the skin itself.

CHEMICAL COMPOSITION OF BUTTER.—The analyses of butter show a varying proportion of oleine and margarino fats. Summer butter usually contains of oleine 60, and of margarino, 40 per cent., while in winter these proportions are reversed. By ordinary treatment the quality of butter in winter is markedly inferior, because the common materials fed are deficient in oil, starch, sugar, etc. If a cow consumes 25 pounds of hay per day, it will be equal in dry material to 100 pounds of young grass. The 100 pounds of grass will yield more butter than the hay. The hay is equal in albuminous matter and oil to the grass, but is deficient in starch, sugar, etc., which accounts for the difference.

The Canada Farmer

TORONTO, CANADA, MAY 15, 1875.

Work for May-June.

The month from May 15 to June 15 is a time when one piece of work crowds closely on the heels of another. To attempt to tell all that is to be done now would be futile. From sunrise to sunset the lazy man and the industrious man alike must work; the great difference between the two being, that the industrious man drives his work, while the lazy man's work drives him.

May is supposed by those who derive their notions of the seasons from the English pastoral poets to be a season of ethereal mildness, in which the leaves are out, the air laden with the perfume of millions of blossoms, and all nature is in her bridal array. Nature would find her bridal array decidedly too thin a costume this year; and if those shepherdesses that we read of in books, with their tuneful lutes, short dresses, coquettish hats, pastoral crooks and the rest of their fixings, could have been set down, here in Toronto, on May-day, while that full grown snow-storm was howling around, the poor things would have realized that the first of May on this continent can be quite a different kind of day from that which poets have created. Nor is it only on this continent that May-day is false to its traditions. England herself, notwithstanding her madrigals, has known many a May-day ushered in with as fierce a storm as that which fell to our lot this year.

By general consent, the present is allowed to be a late Spring. How far it is so depends much on the character of the few days following the time at which we write this. Everything seems ready to start into life as soon as the proper time comes. On May 3, a few miles from Toronto, we noticed that, a foot underground, on a hill from which the snow had been blown during the winter, the soil was still frozen. Late or not, it can scarcely be called an unfavorable spring. The snow lay deep till all the severe frosts were gone; and then it vanished, causing very little damage.

Active farmers will have sown all or most of their spring grain by the time this issue reaches them. The seed should be sown immediately after the land has been tilled and while it has moisture enough to insure germination. When in a proper condition, a good rolling will pack the earth together, retaining the moisture and encouraging rapid growth of the seed.

Corn land should be cleaned religiously, enriched with manure and in good tilth. While it is not well to plant so early as to incur danger of the seed rotting from cold and wet, it is advisable to be early enough so that damage by the cut worm and other depredators can be repaired by replanting. And sometimes a very early planting of corn succeeds, while, in the same year, a later, but still early, planting rots in the ground. Spare no expense in getting the best seed, and try its vitality by sprouting a few cobs in the house beforehand. Many farmers drill corn instead of planting it in checkers. They claim a largely-increased yield per acre from the drilled corn. An illustration of an improved marker will be found elsewhere.

Before the grass in the meadows is high, everything that can obstruct the progress of the mower should be taken away. It is well to roll meadows in the spring, thereby pulverizing clods, stopping fissures, and making so even a surface that the mower can cut the heaviest growth of the grass, i.e., that at the bottom. Do not let stock on meadows in the spring. Some experienced grass growers never let stock on their meadows at all, allowing the aftermath to rot on the surface and serve as a mulch.

It is not necessary to impress upon our readers the value of the root-crops. Mangolds, Swede turnips and sugar-beets will be found to yield enormous weights per acre if diligently attended to. Carrots are so valuable for horses that every farmer should grow a few; and there is money in carrots for market, too. Sow two, or two and a half pounds to the acre.

For potatoes, the soil cannot easily be made too rich. Let the soil be deeply tilled and free from standing water.

Select medium-sized, clean, good-looking tubers for seed and plant none but the best varieties. As a rule, the earlier planted the better; but wait a week or two rather than plant in badly-prepared soil. Some prefer to plant the whole tuber; others to cut the potato into several sets; each party is confident that their own way is the best. Do not let the tubers waste their energies in sprouting before they are planted. The sets should be planted soon after being cut. If planted in hills, mark off the land three feet each way and plant one tuber or two sets at each hill. Cover with a hoe two or two and a half inches deep. A small quantity of superphosphate in each hill will tell a wonderful story. If drills are used, plant 18 inches apart in the drill, with the rows three feet apart. Cover with a plough, and when the weeds show, go over with a light harrow.

Some green crop should be grown to help out the pastures in spring and fall. Cattle turned out too early do themselves and the pastures much damage. Rye sown in the fall and cut before it gets hard, and followed by rye sown in the spring, will lengthen out the season till the grass is well grown, and the cattle can race about, as they will be sure to do on their release, without poaching and honey-combing the ground. What rye is not wanted for soiling can be cut and cured for winter forage.

Horses and working cattle should be fed liberally with the best quality of provender and the purest of water. Care should be taken that good water is easy accessible. Recollect that oxen cannot digest their food until they have ruminated. Let both them and the horses have a good breathing-time at noon. Do not change from dry to green food too abruptly, or "hoven" will trouble your cattle. Commence by turning them out for an hour in the day-time, feeding dry hay night and morning. For milch cows, moisten cut hay and sprinkle on it a liberal allowance of bran or corn-meal. Let the calves have all the milk that can be spared. In three or four weeks substitute partly thin oatmeal gruel or flaxseed tea. Train them early to eat hay and linseed cake, bran, oatmeal, etc., and let them have free run of a warm, sunny pasture. Lambs should be castrated and docked when from a fortnight to a month old; and the old sheep should be tagged and examined for signs of scab or rot. If found, isolate the affected animals immediately.

As soon as the more pressing labors are over, give attention to the garden. Plant vegetables of all varieties that your soil is fit for. The soil should have been well worked in the fall, and, if it was so worked, it will now be in splendid condition. If not, dig it well, and let the weather crumble it down. Do not plant while the soil is lumpy, even if a delay of a week or two is necessary. The droppings of the fowl, mixed with saw-dust, sand or dry muck, make a splendid fertilizer for garden use. House-slops and soap-suds, soot, ashes, broken bones, etc., will all find a paying place in the garden. Early potatoes, peas, parsnips, carrots, sweet corn, beets, turnips, cabbages, etc., can be produced in abundance. If practicable, grow in rows the entire length of the garden, so that horse labor may be used in cultivating. Plant corn every ten days or so in succession. There is no reason why corn should be planted in hills in the garden unless a large amount is grown for market. Endeavor to have a succession of vegetables from the earliest to the latest. Get brush ready for the peas. Use the best tools you can buy and clean them every evening after using.

In planting out fruit trees do it carefully and well. Dig a large hole and pulverize the soil, spread the roots and mulch. It is better to plant half the number in a day, and have them all live, than to set out a great lot, of which half die from carelessness and haste.

Remove all dead, decaying or broken branches from fruit trees, and cut out useless ones. Where two limbs cross and chafe each other, cut out the under one, as the wounded surface of the upper one is best protected from sun and rain. Grafting should be completed this month.

The soil between the strawberry hills should be freshened up and pulverized, and, after removing all weeds, mulch should be applied to retain the moisture. If plants are not wanted, cut off all the runners.

Set out gooseberry and currant cuttings, which should have been cut last fall or before the buds began to start. Cut out from the currant bushes any twigs which borers have injured.

Evergreens succeed best when transplanted about this time. Be careful not to let the roots dry. Evergreens can be killed by a few minutes exposure to the sun or a drying wind.

Look to your own health and that of your family, first of all. See that no stagnant pools are allowed to generate malaria near the house, and that no heaps of putrefying animal or vegetable matter be allowed to waste their valuable sweetness anywhere but in their proper place—the farm or garden. Eat fresh meat whenever it can be got. It is cheaper than salt pork, at last, if not at first. Vary the diet with as many sorts of vegetables as can be raised, and numerous attacks of "biliousness" and more serious disorders of the functions may be averted.

New Ways to Select Hired Help.

A friend of ours once gave us his opinion that farmers who wanted to get AI help should have the heads of aspirants examined by a phrenologist. He would hire men whose cranial development was such as promised conscientiousness, benevolence and the rest of the good qualities, and would diligently let alone all whose heads did not come up to the required level. Naturally enough, this proposition excited some merriment among the persons for whose guidance it was intended; but, phrenology aside, the principle of the suggestion was correct. There is nothing so conducive to a pleasant life on the farm as to have hired men of a cheerful, willing and painstaking type—and if they could be secured by an examination of bumps, the sooner phrenology was a part of a farmer's education, the better it would be.

Touching this question of hired men and their dispositions, the *Rural New Yorker* declares in favor of habitual whistlers, and cites an old farmer who always hired whistlers, and, we presume, paid them according to their proficiency as whistlers, for he seems to have deemed them valuable in that proportion. This old farmer said he never knew a whistling laborer to find fault with his food, his bed, or complain of any little extra work he was asked to perform. Such a man was generally kind to children and to animals in his care. He would whistle a chilled lamb into warmth and life, and would bring in his half-full of eggs from the barn without breaking one of them. He found such a man more careful about closing gates, putting up the bars and seeing that the nuts on his plough were all properly tightened before he took it into the field. He never knew a whistling hired man to kick or beat a cow, nor drive her on a run into a stable. He had noticed that the sheep he fed in the yard and shed gathered around him as he whistled, without fear. He never had employed a whistler who was not thoughtful and economical.

We think the *Rural New Yorker* ought to have ascertained from the old farmer, whether he thought the men whistled because they were good, or were good because they whistled. If the latter, there is no occasion for any farm-hand to be grumpy or morose, or to growl about being disturbed before sunrise any more. All he has to do is to cultivate the noble art of whistling and grow "jolly" after the manner of Mark Tapley in spite of trouble.

AN OUTBREAK OF GLANDERS at the United States barracks at Benicia, Cal., affords an exemplification of a fact already well known, but which some persons dispute, viz., that that terrible disease is communicable to man. The outbreak appears to have been a very violent one, and the accounts we have show that infected animals were allowed to be in contact with healthy ones—a thing which no one knowing the infectious and incurable nature of glanders would allow. After a year's struggling with the disease, a wholesale slaughter was instituted, the first batch consisting of forty-two noble animals. It is expected that the remainder of the 150 horses stationed there will show infection and will have to die. One man, named Donnelly, took the disease, it is supposed by inoculation, and died after forty days of horrible suffering. The disease affected his lungs and his face, the latter being converted into one terrible mass of poisonous ulcers. Others of the men are in dread that they may take the disease. This should be a warning to every one who has a horse that is glandered, to at once put him out of misery, and thus avoid the chance of inflicting upon other horses or human beings the tortures of a loathsome and incurable disease.

Hullless Oats.

EDITOR CANADA FARMER. I see in your March number an article warning readers against buying Hullless oats, as being a swindle. Having visited the vicinity in which they were grown, and having driven around amongst the farmers for some two days to satisfy myself about said oats, I found them fully what they were represented to be, yielding as many bushels to the acre as the other oats, and weighing from 50 to 56 lbs. per bushel. And I found men who would not touch them last year, sowing from thirty to fifty acres this season. Hoping you will insert this in your valuable paper.

I am, Yours, &c
JAMES GIENNIE

Passlinch, April 15th.

The above came just too late for our last issue. We did not call the Hullless oats a swindle, except in so far that they were claimed to be a new thing—an "agricultural wonder," were the exact words—whereas, hullless oats have been known from time immemorial, and were tried and found wanting on this continent some forty years since. To an unprejudiced mind, the fact that varieties—there are several varieties of skinless oats—could be so long known without coming into general use, would be proof positive that they were of no practical value.

In addition to the above letter—which is a perfectly courteous one, and of the class which we desire to be written to us whenever our readers notice any statement with which they do not agree—we have received another from a gentleman who has some Hullless oats to sell, and who is somewhat indignant with us for mentioning the historical fact that Hullless oats have already been tried and found wanting. He seems to think that we have neglected our duty in that we did not expatiate on the virtues of his miraculous cereal—in short, he seems to imagine that the CANADA FARMER exists only for the purpose of enabling the owners of "agricultural wonders" to realize a dollar a pound, more or less, for their prodigies.

The last-mentioned gentleman was so good as to send us a sample of his oats, and some meal made therefrom for our inspection—we presume for the purpose of convincing us that we were wrong in asserting that hullless varieties have heretofore proved unprofitable, for that is all that we have said against them. No one could truthfully say a word against the appearance of the grain or meal which may be said to be first-class; but, if the oats shell so badly as to be unharvestable, it matters little of how good a quality the grain may be. But, accompanying the sample of oats, comes a printed paper purporting to be signed by nine gentlemen who grew the oats last year, certifying that the oats are less liable to drop than any other oats they have ever raised. If this particular variety of Hullless oats should, on longer trial, be found to retain this quality, which is possessed by no other naked variety, then Hullless oats will become free from the stigma of unprofitableness, but till then, in the light of the experience of the former generation, that character will attach to them.

We do not know whether the Hullless oats mentioned by our correspondent are the same variety as those we had in view at the time we mentioned that Hullless oats were not a new thing. We have compared the "Bohemian" and can see no difference in them. Our correspondent says he obtained his hullless variety from Wisconsin, from which circumstance he dubs them "Bohemian oats." The first thing we heard about the re-visit of Hullless oats was the receiving of a flaming circular from a Vermont man. He says that he originated them by hybridizing Californian and English oats, and claims all sorts of non-seasonal unprofitabilities for them—enough to cast suspicion upon the oats even if their character had not already been under a cloud. We should have been grossly wanting in our duty to our readers had we failed to point out the historical facts which militate against the probability of the common oats ever being pushed into the background by their countless kindred.

Getting Rid of the Colorado Beetle.

In the last two numbers of the CANADA FARMER we have stated the case against the use of mineral poisons to destroy the Colorado beetle. We have shown, on the authority of eminent chemists of this continent and Europe that Paris green (arsenate of copper), though it has not been yet found in the tubers of potatoes to the tops of which it

has been applied, is yet capable of being taken up unchanged by other crops; and that the poison will remain in the land till it is taken up; and therefore that, although the quantity used on an acre in dressing a crop of potatoes is too small to make much difference, repeated yearly applications of the poison would make a different affair of it. There is another reason why the use of Paris green should be discontinued, viz.—That its effects on the human system as well as on plant life are cumulative, that is, a little may be absorbed one day while applying it to the vines, a little the next, and so on, till symptoms of poisoning are developed and probably the patient dies. A man applying the green at short intervals throughout the "bug-season" can hardly avoid breathing some of the poison. He thus places his health, or even his life, in danger.

If it is necessary to poison the *Doryphora*, science must invent some vegetable poison which the plants can assimilate and deprive of its noxious qualities. It is alleged that a decoction of the common mandrake root will kill the beetles. This should be tried and settled.

Of other modes of getting ahead of the potato-bug we may cite the following:—Employing poultry as auxiliaries; some persons, however, allege that chickens eat more of the parasites which nature has raised up to prey on the Colorado beetle, than they do of the beetle itself. A correspondent of the New York Tribune plants a few hills very early and very far apart so that the beetles can be easily seen. They will gather on these early hills, from which they and their eggs can be handpicked. The first stock of beetles is thus destroyed before the main crop of potatoes is ready for them.

A Germantown Telegraph correspondent goes over the ground with a slanting tooth-harrow, the bars of which knock off the grubs, while the teeth bury them in the earth. When the plants become too tall to allow the use of the harrow, he uses the cultivator, and attaches by cords three or four bars of wood, hanging transversely across underneath just in advance of the shovels, these dangling loosely against the vines, knock off the bugs, and the shovels bury them. There they perish, as they cannot travel yet in the earth. He does this in a hot, dry day, he goes over them in this way once a week, occupying about two hours, and not only keeps off the bugs, but benefits the crop largely by the frequent cultivation.

An application of fine hen-dung soon after the plants appeared was tried last year by a Country Gentleman correspondent, and he says that beetles will not touch potatoes so treated.

Another New York Tribune correspondent, an Ohio farmer, says that he has been bothered with beetles for the last two years. The first season he picked them off and used Paris-green, but his potatoes were so injured that there was not half a crop, and on boiling the potatoes a greenish scum would rise to the surface. Last year he took a pan two feet broad and jarred the destroyers into it with a stick; he could do this more rapidly than he could apply Paris-green. He went over the patch several times, and his potatoes were not injured. The old kind of bugs came in myriads, and he caught them the same way, and poured them into a straight kettle with a lid.

WE SHOULD BE GLAD TO RECEIVE from our readers specimens of insect predators which we will do our best to name, and the remedy or preventive for which we will endeavor to point out.

A new swindle is being tried in the economy of hauling, by introducing caoutchouc in the harness of draught animals, so as to augment the strength of the cattle, on the principle that a weight attached to a spring can be raised more readily than if lifted without it, or like the elastic union of a railway train.

Mr. J. PERIAM, agricultural editor of the Chicago Tribune, and one than whom no person is more qualified to know whereof he writes, says that more work can be done in a day's ploughing with three horses abreast than can be done with four horses in line or two and two, as the weight of the tackle and the loss by the misdirection of the draught will more than compensate for one horse's work. Mr. Periam strongly commends the three-horse-equalizer depicted in last month's CANADA FARMER, as being effective, and so simple that any farmer could make and any blacksmith iron it.

WE DIRECT ATTENTION to the advertisement of Dynanite by Messrs. Young & Co.

HIPPOPHAGY IS MAKING great strides in Paris. The number of horses, asses and mules devoted to food in Paris, was 2152 in 1867, 2658 in 1869, 5732 in 1872, and 7184 in 1874. The Journal de Paris says, "This progress shows that the public is by degrees losing its prejudice against this description of aliment." With the design of promoting hippophagy in France and to lead to the opening of shops for the sale of horseflesh in England and America, a grand horse-banquet was held in April at the Grand Hotel, at which the viands were exclusively of equine or asinine origin.

SOME CANADIAN, as well as many American, Patrons have been victimized by a "Grangers'-Store" firm in New York, trading under the name of "Farley & Co.," whose business was conducted on the principle of receiving cash in advance for orders which were not filled. And now comes the New York World with an announcement that Farley is the brother-in-law of Worthy Secretary Kelley, of the National Grange, and with a hint that the "Co." was none other than the Worthy Secretary's own self. The World also stated that Mr. Kelley would pay all debts due from Farley & Co. Mr. Kelley declares that he is not going to do any such thing. Altogether, it is a pretty kettle of fish. Canadian Patrons may congratulate themselves that the foresight of the gentlemen who introduced the Order on this side of the line, established the Dominion Grange in entire independence of the National Grange of the United States. The wisdom of the course adopted is now apparent. The stability of the Order in Canada will not be affected by any proceedings of the members of the National Grange, either collectively or individually.

"WHY SHOULD NOT COUNTRY PHYSICIANS study veterinary practice so that they could give advice in regard to the troubles of farm stock?" The American Agriculturist thinks it would be of immense advantage to farmers if such a thing could be brought about, and that it would tend to rid the country of a host of quacks and "cow doctors," so called, who are ignorant of what they profess, and often inflict much needless suffering upon animals. We agree with our cotemporary on this point. Relieving the sufferings of the animals subjected to us is a mission only less noble than that of healing the "lord of creation" himself. Many a country physician, from motives of humanity alone, would prescribe for sick horses and cattle were it not that he would lose caste if he were to lift a finger to save a poor brute from agony. And many struggling young doctors, who are now eking out their existence in shabby gentility and enforced idleness, could be placed at once in comfortable circumstances if they were permitted to avail themselves of practice within easy reach. Away, say we, with the ridiculous nonsense that will allow animals to suffer, frauds to flourish, and competent men to starve, just to gratify the requirements of overstrained professional etiquette.

"COBBETT'S 100-FOLD ACCLIMATED CORN" is the latest "agricultural wonder" in England. About a hundred years ago, when the growth of population began to cause alarm in the minds of English statesmen that food could not be produced in sufficient quantity to avoid a famine in case England should lose her supremacy at sea, Indian corn was introduced there, in the hope that its large yield would solve the problem. For the first few years the corn came to perfection, and in the south of the country it was planted largely. It soon became apparent, however, that the summers were not long enough, and corn fell into disuse. Now, however, William Cobbett, son of the famous agitator, claims to have successfully acclimated corn in England, and we notice in the *Wills and Gloucestershire Standard* a letter from him, giving directions for its culture by intending growers on the Cotswold hills. He tells them to plant in the first week of April, unless very cold; in drills, four feet apart, to hand-hoe thoroughly; and, when the plants approach 18 inches high, to earth up four inches of the stalk. He says his corn is thoroughly hardy, having passed through severe frosts in the middle of last June uninjured. We shall look with interest for the result of corn-growing on the Cotswolds. Corn that will grow there must be of a cast iron hardness, and would be as valuable here as in England.

The Ontario School of Agriculture.

The first term of the Ontario School of Agriculture closed on April 15th. The occasion was celebrated by a public presentation of the prizes awarded to those of the students who had been most successful in examinations that had taken place a few days previously, and by a public display of the progress made during the first year of the School's existence. A large and influential gathering of farmers and other gentlemen of all shades of political leaning proved that the importance of the subject of agricultural education is beginning to be properly appreciated.

The Hon. Mr. McKellar, Minister of Agriculture, presided and opened the proceedings with a speech expressive of his gratification at the present state of the Institution. The ceremony of the presentation of the prizes was then gone through. That being completed, a class of students was called up and examined, *viva voce* by the Rev. R. Burnett, who together with Prof. Buckland, had, during the winter, delivered lectures on, among other things, the subjects on which the students were now examined. Rev. Mr. Burnett asked the class to give him some reasons for the establishment of Horticultural exhibitions. To this question the students answered successively: That exhibitions stimulate gardeners to originate new varieties and improve old ones; that they tend to elevate the tastes of the people; that they excite competition among the people, and competition is the soul of business; that they tend to increase the taste of the people for fruit, for when people see first-class fruit they want to buy it; that they foster the growing of new varieties by hybridization, and the testing for hardness and profitableness of foreign varieties.

The examiner then asked the class to give the best three modes of preparing the soil for crops. The students answered that draining, digging, and trenching and subsoiling were three. They were then asked to give some of the benefits of draining. Answers were given that draining dries the soil, gets an early seed-bed; that it is less expensive to work drained land; that the seed can be got in early; crops mature earlier and can be harvested earlier; that the drains allow the warm water to pass into the soil; that the soil is relieved of stagnant water, the presence of which renders it sour and cold; that it allows frost to get into and pulverize the soil; that manures act more efficiently; that the rain can more easily filter through the soil, and the air more readily follow it; that it improves the climate of the country; allows plant-roots to go down much deeper. Subsoiling was described by the students to be the removing of the top soil and the throwing of the subsoil to the surface, thereby allowing the air to oxydize it; it breaks up hard-pan and lets the water percolate through it; puts down the top soil for the use of the roots; brings up valuable ingredients which had been washed down by the rain. About manures, it was answered that barn-yard manure was the mainstay; it was composed of the droppings of animals and their bedding; for economy it should be made under cover and over absorbents, which would fix the ammonia; sulphate of lime is the best absorbent; other manures were:—guano, nitrate of soda, dead animals, woollen rags, blood; green manure was the ploughing under of certain crops, as clover or buckwheat; leached or unleached ashes are valuable, the latter the most so, on account of the potash contained; guano was the most valuable artificial manure; artificial manures act more quickly than the barnyard article; phosphatic guano benefited light land, ammoniacal guano heavy land.

Hon. Mr. McKellar then, in a few well-chosen words, introduced the new Principal, Professor Roberts, who had arrived from England but a few hours previously.

Principal Roberts, who was received with the greatest cordiality, thanked the assemblage for their manifest good will to him, and proceeded to sketch out an outline of his intentions as respected the carrying on of the school.

Speeches from Mr. Melvin, Mayor of Guelph, Mr. Straton, M.P., Dr. Clarke, Mr. Ludlaw, Col. Hignbotham, M.P., Mr. McRae, Revs. Ball, Clarke, Wardrope and Burnett, and Mr. Shaff closed the proceedings.

To all appearance, at the close of this first term, the School of Agriculture was launched on a career of prosperity as gratifying as it was novel. Principal Roberts had shown that he merited the high encomiums which distinguished English agriculturists had bestowed upon him, and we, in common with other hearers of his salutatory speech, were confident that the right man had been so-

cured for the head of the institution. It was with feelings of no ordinary sorrow that we learned, a few days after the events above recorded, that Mr. Roberts had been compelled by a sudden and serious illness, to resign his position as Principal. His affliction, brought on as it was by intense anxiety and devotion to study, will, we trust, only temporarily disqualify him from discharging the duties of an office which he had given every promise of being able to fill excellently. He and his friends have the hearty sympathy of all who can realize the crushing disappointment that would attend the cutting short of a career of usefulness which opened with such good promise.

In the meantime on the recommendation of the commission which manages the school, the Government have appointed Mr. William Johnston, B.A., the Rector of the college, to be acting Principal; and James Laidlaw, esq., a well-known agriculturist, to superintend the farm operations and improvements.

THE REPORT OF THE ONTARIO FRUIT-GROWERS' ASSOCIATION is received, and with it the report of the Entomological Society. The contents are of the usual practical and valuable character.

OUR THANKS ARE DUE for the 1872 and 1873 volumes of the Proceedings of the Ohio State Board of Agriculture. The contents of the volumes are of a practical and varied type, reflecting credit on the Board and on their well-known Secretary, Mr. John H. Klippart. The Agriculturists of Ohio are fortunate in having officials so alive to the importance of the farming interests, and so able to give effect to their desire to benefit them.

THE ILLINOIS CORRESPONDENT of the *Country Gentleman*, Prof. B. F. Johnson, of Champaign, says that the outlook of the Illinois farmers for 1875 is gloomy in the extreme. "Considering that we have had no heavy rain since June, 1873, that sloughs are dry, creeks empty and wells already bare of water—that water is carted and sold as if it were August or October—that we have already had several thunder storms without rain, and that our sky is half the time covered with clouds which drop no water,—that in fine, all and singular of meteorological phenomena point to and presage a dry, hot summer,—it is impossible not to anticipate a great drouth as the impending calamity. If the drouth of 1874 is repeated in Illinois in 1875, the losses and misery following it will be beyond comprehension or compensation—unless such a catastrophe shall have aroused the country to the peril of the situation." Prof. Johnson points out as the remedy of this evil, the restoration of the open ponds which once covered the lower parts of the prairies, and the setting of their borders with fast-growing trees.

AS BEARING ON THE QUESTION of Agricultural education and "book farming" generally, the following from the pen of Mr. Mechi will carry weight:—"It is a painful truth that an agricultural library rarely forms a part of a farmer's investment; but the school-master is abroad now, so that we may reasonably hope for better things; and I never met with a farmer who was educated at our Royal Agricultural College at Cirencester, who did not show the good effects of theory combined with practice—the why and wherefore. Out of a million of farmers, great and small, in the United Kingdom there are not twenty thousand who belong to the three great agricultural societies of England, Ireland and Scotland, and who benefit by their publications. This is sad evidence of the lack of literature in agriculture. I hope the time will come when no British farmer can be found, who will say: 'None of your theory or book-farming for me—I am a practical man; for as the great man Baron Liebig truly says: 'Theory is not opposed to successful practice, but is an explanation of the cause of its being successful.'" Now, there could not be cited in favor of "book-farming," a better example than Mr. Mechi himself, who after realizing in London a fortune as a cutler, applied himself to farming with no other preparation than the business tact of a successful merchant, an unlimited quantity of common sense, and such knowledge of agriculture as could be derived from the farm literature of the day, which literature he himself has since enriched to a surprising extent. By the way, we are sorry to note, in one of our English exchanges, that Mr. Mechi had suffered a severe injury to the eye, and was compelled to beg the indulgence of his hosts of correspondents.

MR. WILLIAM CARR, of Devonshire, a noted writer on short-horns, died in April last, aged 62.

It is easy enough to make the acquaintance of tree peddlers. "Buy their fruits—ye shall know them."

A NEW ENEMY TO THE POTATO CROP has appeared—this time in the Old World. It is the *Brystopha Solanella*, a minute moth which has appeared in Algeria. The larvae destroy the potatoes so that the tubers are unfit even for pig-feed. A French journal warns its readers against the importation of this pest.

A French inventor, M. Tellier, has produced a design for what he calls a "butcher ship" for the preservation by his process of artificial cold, and the transport of meat from Australia and South America. The engine room is quite aft, and the cold-producing machinery is behind this room; the remainder of the ship is divided into compartments, all fitted up with stalls, wherein the joints are suspended, with facilities for examining the meat throughout the passage. This particular invention may not solve the problem of the cheap supply of meat to the masses of England, but sooner or later it will be solved. As soon as a cheap and sure method can be found to transport Canadian-killed meat to England, it will be a good thing for our farmers, and a bad thing for our meat consumers, for the price of meat will certainly go up. There is an instructive difference in the relative prices of meat and grain here and in England. Wheat is, here, 6th May, \$1.00; in England it is about \$1.32 per bushel. First-class cattle, here, bring \$5.00 @ \$5.25; in Liverpool, \$15.00 @ \$18.00 per 100 lbs. The margin on wheat, our principal export, is thus seen to be small, while on meat it is large enough to pay all risks of ocean casualties and leave a handsome profit.

BREWERS ARE APT TO GET ANGRY if any one venture to insinuate that other bitters than hops are used in the manufacture of beer. And yet there are two curious facts that can only be accounted for on the hypothesis that hops alone do not furnish all the bitter element in beer, viz. :—That in the period in which the amount of beer brewed has trebled and quadrupled, the production of hops has stood still or retrograded; and that the amount of quassia, colocynth, aloes, colchicum, strychnine and other bitters disposed of by wholesale druggists is out of all bounds beyond the reasonable requirements of the medical profession. English attention is now being directed to this point. In 1862, the hop duty was repealed, and thereby the power of the Excise to interfere with the composition of the beer was taken away. Since then the composition of beer has become a fearful and wonderful secret. The duty was taken off the hops as a boon to the growers. The hop-growers now want the duty restored, as it would then be the province of Government to see that no other bitter was used. So, with respect to the national beverage, England shows the curious spectacle of the barley-growers clamoring for a repeal of the malt-tax, while the hop-growers are equally anxious that the hop-tax should be re-imposed.

OF ALL PROFESSIONS, farming is the one in which there is the most scope for the practice of small economies. In fact, it may be said of general farming, that the profits lie in the trifles saved and the little leaks stopped. How may these trifles be saved? And how may we stop the little leaks? are questions which every Canadian farmer should ask himself. Here is an answer containing advice, the following of which would make a wonderful difference in the outgoings of a farm. "When you go to a mechanic," says a correspondent of the *New York Tribune*, "to get a job of repairing done, and are waiting for the master workman to do it, don't go off to the store or whisky shop and loiter away your time, if nothing more. Stay by the mechanic and watch him. When the job is completed, ask yourself whether you could not have done it at home, if you had provided yourself with a few tools such as no farmer should be without, and thereby save your time (which is money), and your money too. The young farmer will soon find by a little perseverance that there is pleasure in this branch of economy. He will find himself happily engaged all the rainy, bad weather in keeping not only his shoes in repair, but his harness and farming implements. This branch of industrious economy will stimulate him to take better care of his tools by housing them and keeping them painted."

Agricultural Intelligence.

Ontario Veterinary College.

The students of this institution underwent their examination at the close of the winter session on April 16. Their attainments were shown to be of a high order of merit, such as reflects the most flattering compliments upon the Principal of the College, Mr. A. Smith, V. S. The students were examined orally and in writing upon Anatomy, physiology, chemistry, materia medica, and diseases of the horse and other domesticated animals.

The following students passed the final examination:—James Anderson, Drummond; Chas. J. Brodie, Bloomington; Thos. S. Carson, London; J. R. Hagyard, Campbell's Cross; A. M. McCollum, Campbell's Cross; T. H. Murrice, Arnprior; Wm. Ridd, Brampton; G. L. Robson, Prince Albert; G. Swinbourne, Montreal. The following are the names of those who passed the primary examination:—J. Beatty, Colbourg; A. Gunn, Beaverton; Thos. Hood, Brampton; W. J. Hinman, Grafton; R. D. Howard, Castile, N. Y.

The Board of Examiners were:—M. Barrett, M. D., Toronto; J. Thornton, M. D., Toronto; J. H. Wilson, V. S., Ont., London; W. Cowan, V. S., Ont., Galt; I. S. Caesar, V. S., Ont., Port Hope; C. H. Sweetapple, V. S., Ont., Brooklin, Thos. Lloyd, V. S., Ont., Newmarket.

The Veterinary Medical Association held a meeting during the examination. Several new members were elected. A paper on the common diseases of the horse was read by Mr. E. T. Hagyard. The paper will be found, slightly condensed, in our veterinary columns.

The staff of the College consists of the following well-known professional gentlemen:—Andrew Smith, V. S., Edin., Anatomy and Diseases of Domesticated Animals. Dr. Barrett, M. A., M. D., Physiology; James Thorburn, M. D., Edin., Materia Medica; Prof. Croft, Chemistry; Prof. Buckland, Breeding and Management of Farm Animals; L. A. Grange, V. S., Demonstrator of Anatomy.

The Ontario Veterinary College is proving its usefulness by the success of the graduates who have passed through its course and are now practising both in the Dominion and the United States. We are claiming none too much in asserting that this institution is the most successful of its nature on the continent.

The Growth in Value of Short-Horns.

The annexed interesting particulars of the early days of the Short-horns, and the comparison of the average prices realized year by year, are furnished by a correspondent of the London Field:

In 1822, in a small provincial town, Otley, appeared the first volume of a register, the transfer of which, during the past year, has caused no small amount of spoken, written, printed words. The book was Coates' "Herd Book of Short-horned Cattle, or, as the editor adds, "of the improved Durham breed." Mr. Coates—who gives the address Carlton, near Poole—states in his preface that the entries are "from the earliest account to the year 1822." Yet even so, ranging over so wide an interval, the entries of bulls (including those in a supplement, the property of Mr. Champion, of Blyth, to which no numbers are attached) amount only to 741. The entries of cows (also including late entries) were 1043; and to make up this number, many maiden heifers are entered by separate entries to their dams.

To some of the entries is appended the phrase "did not breed, and to not a few of the bulls the word "steered." To some few pedigrees the fate of the animal is added by way of a postscript: thus, "Happened a misfortune" is one of these terse sentences, "Liberty was sold to the butcher in 1814" is another.

The illustrations are certainly not highly finished works of art, yet they have the recommendation of preserving distinctive characteristics. There are no engravings of bulls, but the cows are by no means all alike, nor all in one position, nor do they often look as if they had been cut with a mould out of gingerbread.

The list of subscribers contains 442 names, of whom about a dozen are Irish, scarcely more than half that number Scotch, whilst five-sixths of the whole are from the counties of Nottingham, Lincoln, Durham, and York. The twentieth volume of the series appeared in 1873, containing the entries of the two previous years. It was published in the metropolis of Great and Greater Britain. It contained 2551 bulls (making up the number registered since the commencement to above 32,000), and also the names of 3239 cows which had female produce during the same period. Those which produced males only are for the most part omitted.

The subscribers were 776 in number, and, whilst those from the four counties above named have not very largely increased, almost every county in the three kingdoms is represented; whilst addresses are given of subscribers who reside in Pompana, Montreal, Kentucky and half a dozen other States of North America, California, Queensland (Aus-

tralia), New Zealand, New South Wales. And in the new number of Mr. Thornton's "Short-horn Circular," just issued to subscribers, means are afforded for making other contracts scarcely less enlightening as to the increase of the breed and its value. This circular has been in existence seven years; and, during this period, the average value per head of short-horns (sold by their breeders at home, by public auction) has not far from doubled. This increase has been regular, as the following table will show:—

In 1869	average of	1877	1883	1891	1899
1869	1870	1871	1872	1873	1874
1477	1839	2061	1922	1929	2165
£35 7 0	35 12 10	45 18 2	48 9 8	53 16 4	61 18 0

One of the principal features, it is stated, of the past season was the briskness with which good-looking short-pedigreed stock were competed for by local buyers. By way of illustrating this, some five or six sales are included which contained a large number of lots of this character. These additions have of course lowered the average; and it may be stated, as one of the curiosities of short-horn statistics, that a contemporary published two lists of short-horn sales in 1874, one of those in Great Britain and Ireland, one of those in Canada and the United States. Working out the results of these two, it appeared that the average price of these two (reckoning the dollar at 3s. 7d., present value) was closely alike, being about £70 per head for 2526 animals sold on the other, and 1749 on this side the Atlantic, American being slightly in excess of home prices. Mr. Thornton, by including the sales above mentioned, reduced his average per head some five or six pounds; but, even so, the increase on the value of short-horns is steady, and cannot but be satisfactory to breeders; whilst the large totals received (£140,511. 6s. for 2023 animals here, and £180,747 7s. 4d. for 2526 animals there) show the importance to society generally which the pursuit assumes.

Exhibition Ages.

A suggestion was made, a short time since, in the columns of the *Country Gentleman*, regarding the advisability of having a fixed nominal date for holding live stock shows in the autumn, no matter what the real time might be, so that the ages of animals entered for competition might be calculated to this nominal date. John Snell's Sons, of Edmonton, Ont., write thus to the same journal on the subject:

There is a good precedent for this rule in the practice of the Royal Agricultural Society of England. The annual show of this society is generally held from the 10th to the 15th of July. We have before us the catalogue of entries of live stock for the Royal show for the years 1871-'72-'73, in each of which it is stated that "the ages of animals are calculated to a fixed date, viz. July 1st."

The present is a good time to direct the attention of agricultural societies to this matter, as they are about revising their prize lists, and we have good reason to believe that if all the leading societies in the United States and Canada would fix upon the 1st of September it would be generally acceptable.

There is perhaps no month in the year when it is safer to have pigs and calves born than in September, especially in the case of the former, so that they may have time to get strong and learn to feed well before winter sets in; and if breeders knew that the first of September was a fixed date for this purpose, they would no doubt generally avail themselves of the latitude given in this way, as they do under the present arrangement, and manage to have their young stock born just after the fairs.

There is a poor chance for a calf or a pig to show in the class "one year old," which means over one and under two years, when it is only say twelve months and a few days old, while another that is twenty-three months may compete in the same ring. It would be manifestly more fair that the younger animal should show in the ring "under one year," where he would probably have some competitors that were very nearly twelve months old.

A "NATIONAL POULTRY ASSOCIATION" has been organized in Chicago. Its meetings are to be held in April, July and October, at the *Prairie Farmer* office.

"ONCE," said Mr. Mechi, in a recent address, "England had 2,000,000 people, now we number 32,000,000, but the acres have had no children." He thinks it about time to begin to utilize "the lower story, the subsoil."

A CANADIAN FARMER writes to the *New York World*—"The Grange hero has not stepped beyond its legitimate sphere, and, taking into account the solid and practical character of our farmers, it is developing quite as quickly as it ought to do."

WE HAVE RECEIVED the first number of *La Revue Agricole*, a new agricultural journal addressed to the French-speaking farmers of Quebec. Typographically, it is an exceedingly neat-looking journal. The contents are varied and practical. It will be published monthly at St. Hyacinthe.

THE *Country Gentleman* announces the purchase by the Oneida Community from Mr. Crozier, of Long Island, of four Ayrshires for \$1,300.

TWO FINE CLYDESDALES, purchased by Mr. John Morrison, of Scarborough, in Scotland, arrived at his farm recently.

AT A MEETING at Ingersoll, lately, arrangements were made for the establishment there of a fortnightly cheese fair, the first to be held on May 25th.

SIR JOSEPH HAWLEY, one of England's most successful breeders of race-horses, died in April. He won the Derby four times, with Teddington, Beadman, Musjid and Bluegown.

AN INTERNATIONAL HORTICULTURAL EXHIBITION and Congress is to be held at Amsterdam in 1876. We have received programmes and bulletins requesting us to give the project publicity in the Dominion.

MR. JOHN BOAKE, of Milton, won the first prize at Brampton Spring Fair with a newly-imported yearling roan bull, Duke of Cumberland, from the herd of John Lamb, of Penrith. The Duke is by Hubbsel, jr.

MR. PASCHALL MORRIS, editor of the *Practical Farmer*, of Philadelphia, died three weeks since. He passed a long and honorable life as a farmer and editor, and, in losing him, the farmers of Philadelphia lose one of their best men.

THE FOLLOWING CATALOGUES are to hand.—The Dushberg grape catalogue from Bush, Son & Messner, Bushberg, Mo.; James Fleming, Toronto, plants, bulls and seeds, No. 3 of Vick's *Floral Guide* for 1875, April No. of Briggs' Quarterly Floral work.

SULLIVAN, the well-known farmer of El Paso, Ill., intends to plant 10,000 of his own acres in corn this season, and has rented 9,000 acres more to be planted in corn. He also intends to put 2,500 acres in flax, and 1,000 acres in oats. This is farming on a gigantic scale.

THE EARL OF DUCIE has been elected chairman of the Committee of Management of the Gloucester Agricultural College, in the room of Mr. Edward Holland, of Dumbarton, lately deceased, who was one of the earliest and staunchest supporters of the institution. The Marquis of Lansdown succeeds Mr. Holland, as Member of the Council.

MR. JAMES LAWRIE, of Malvern, has sold for \$500 to Mr. Geo. Thompson, of Bradford, the imported Ayrshire cow, Medora, and c. c. by Sealfield; Mormad and b. c. by same; and Music. Mr. Thompson has also purchased from Mr. Wheeler, of Woburn, the Ayrshire bull, Tarbolton, and the cow Beauty 2nd.

THE *National Live Stock Journal* declines to place faith in the reports of bullocks that weigh "4,000 pounds and upward," nor does it deem that such increase would be desirable, even if possible. "The medium-sized bullock is not only the best beef, as a general rule, but is by far the most profitable. The big steers are always fed at a loss, unless the owner gets his money back by exhibitions, or some other means than the sale of the carcass."

THE FIFTEENTH SESSION of the American Pomological Society, which will be held in Chicago, on Sep. 8 and two following days, gives promise of being the most important gathering in the history of the Society. All horticultural and kindred societies in the United States and the Dominion are invited to send delegates. The Vice-Presidents for the Dominion are:—Rev. R. Burnet, Hamilton; Mr. Chas. Gibb, Montreal. The Secretary of the Society is W. G. Flagg, Moro, Ill., from whom all necessary information can be obtained.

THE HERFORD HERD of Mr. Green, of Gweranaffael, Wales, was sold on April 11. This herd was one of the most carefully bred in the United Kingdom, though not known to the public by their performances in the show ring, as Mr. Green had an objection to bringing his animals into the condition requisite for success, and therefore abstained from showing them at all. Sixty-three animals brought an average price of thirty-nine guineas. The highest price given was seventy guineas for Cherry the 6th.

BEATIES & MILLER have recently brought from England to their farm at Whitvale, eleven head of Short-horns—3 from Mr. Larking's (2 of them Kirklovingtons), 4 from Sir Curtis Lampson's (including 2 of the Surmises), 2 from Mr. Musgrave, and two from Mr. Clare—all of them pure Bates. An Ayrshire and a Galloway Bull were also among the new-comers, together with 24 Berkshire, and a lot of choice fowl. The cost of the whole was \$17,660. An Ayrshire Bull, that cost \$3,500, died of fright while being lowered into the vessel at Liverpool.

CANADA PHOSPHATE.—In our advertising columns will be found the announcement of the Brockville Chemical and Superphosphate Company, Brockville, Ont. This Company is manufacturing Superphosphate of the best quality wholly from Canadian materials. It is only recently that sulphuric acid, which is indispensable in the manufacture of Superphosphate, has been made in Canada, and the decrease of the imported article has hitherto operated to keep the price of superphosphate beyond the reach of many Canadian farmers. The Company publish a circular which gives much valuable information about the fertilizer and its effects. We recommend our readers to send for it.

Coming Short-Horn Sales.

The dates of the following Short-Horn Sales have been announced :

- May 18, 19, 20, 21, 22, Dexter Park Chicago, J. H. Davis, Danville, Ky.; L. W. Towne, Hannibal, Mo.; J. P. Sanborn, Port Huron, Mich.; Avery & Murphy, Port Huron, Mich.; John R. Shelby, Shramon, Ill.
May 27—Chas. Lowder, Plainfield, Indiana, at Indianapolis.
May 28—S. Meredith & Son, Cambridge City, Indiana.
June 2—W. Douglas, Onondaga, Ont.
June 3—J. R. Martin, Cayuga, Ont.
June 8—J. Bond, Abingdon, Ill.
June 9—T. Mills, Fitchburg, Mass.
June 9—E. Thorne, Millbrook, Ont.
June 11—Corbin & Co., Cedar Rapids, Iowa.
June 16—Beattie & Miller & Hon. M. Cochrane, Toronto, Ont.
June 17—Daves & Co., Lachine, Que.
June 19—Col. Morris, Mt. Fordham, N. Y.
June 23—Hon. D. Christie, Paris, Ont.
July 21—B. F. Vanmeter, Stockplace, near Winchester, Ky.
July 22—The Ashwood and Edgewood Herds of Jas. O. Cunningham & D. H. Cunningham & Co., of Kentucky.
Oct. 20—B. P. Goff, Winchester, Ky.
Oct. 22—J. W. Prewitt, Winchester, Ky.
Oct. 27—Ayres & McClintock, Millersburg, Ky.
English Sales.
July 9—Sir. G. R. Phillips, Weston Park.
Aug. 25—Lord Dunmore, Stirling.
Aug. 27—Late James Fawcett, Scalesby Castle.
Sept. 2—Late Mr. Torr, Aylesby.
Sept. 7—Lord de mersdale, Omskirck.
Sept. 9—Foster & Moore, Hildon, W. Gon.
Sept. 10—Sir W. Lawson, Brayton Castle.
Sept. 14—Brogden & Ashburner, Ulverston.
Sept. 22—H. J. Sheldon, Simpston on Stour.

Short-Horn Sales.

The past month was one of great activity in Short-horn circles. The following great sales were held:—At West Liberty, Ia., on April 14th, the herd of S. W. Jacobs; at Kellogg Station, Ia., on April 15th, the herd of Milton Briggs; at Decatur, Ill., on April 27th, the Harristown herd of J. H. Pickerell, and the herd of Mr. Taylor; at Bloomington, Ill., on April 28th, stock of Messrs. Nicholls, Leroy, Ill., W. R. Duncan, Towanda, Ill., Hon. W. M. Smith, Noah Franklin, and C. Funk, Lexington, Ky.; April 29th, at Bloomington, Ill., the herd of G. J. H. Spears; April 30th, at Springfield, Ill., the herds of Messrs. Prather & Foster, Springfield, and Black, Carrollton, Ill. We give below a list of the animals which brought the best prices, with the purchaser's names and the amount realized:—

Mr. Jacob's Sale

Table listing sales from Mr. Jacob's Sale, including items like Forest Queen, Louan of Slausondale, Bettie Stewart, etc., with prices.

Mr. Milton Briggs' Sale.

Table listing sales from Mr. Milton Briggs' Sale, including items like Queen of Oak Hill, Lady Clark, Louan of Oaklands, etc., with prices.

Mr. Pickerell's Sale.

Table listing sales from Mr. Pickerell's Sale, including items like Louan Hill 4th, Louan Hill 5th, Louan Hill 6th, etc., with prices.

Mr. Taylor's Sale

Table listing sales from Mr. Taylor's Sale, including items like Oxford Duchess, Louan 6th of Poplar Farm, etc., with prices.

Messrs. Nicholls, Duncan, Smith and Funk's Sale.

Table listing sales from Messrs. Nicholls, Duncan, Smith and Funk's Sale, including items like Melody Gwynne 4th, Red Mazurka, Olga 3rd, etc., with prices.

Messrs. Spears & Son's Sale.

Table listing sales from Messrs. Spears & Son's Sale, including items like Sanspareil 23rd, Magenta, Magenta 2nd, etc., with prices.

Messrs. Prather & Foster's, and Black's Sale.

Table listing sales from Messrs. Prather & Foster's, and Black's Sale, including items like Sunlight Flower, Tully 2nd, Fannie Dale 2nd, etc., with prices.

Summary of the Above Sales.

Summary table of sales, including categories like Jacobs, Briggs, Pickerell, Taylor, Nicholls, Spears, Prather, with total counts and average prices.

The total number of head sold at this series of sales was 451; and the average price realized was \$504.86, the total amount, \$227,694. We are indebted to the Comptroller for most of the calculations of the average.

THE TWO HEIFERS, Plumwood Lass, 19 and 20 by 20th Duke of Airdrie have been sold, says the Ohio Farmer, by Mr. R. Dun, of Madison Co., O., to Mr. Hannah, Montgomery Co., Ind., for \$2,250. Also 11th Belle Duchess of Plumwood to Rob. Holloway for \$1,000; and 10th Duchess of Plumwood to Mr. De Graf, of Ohio, for \$1,000.

AT TORONTO, on June 16, Messrs. Beattie & Miller will offer for sale their entire herd of Short-horns comprising 55 cows and heifers, and 7 bulls of the most approved strain; also 26 head of pure Berkshires; 10 draught horses and mares and six Cotswold rams. At the same time and place, Hon. M. H. Cochrane will offer the month old 5th Duke of Hillhurst, Airdrie Duchess 5th, and four other animals from his Compton herd.

MR. WILSON WILSON'S short-horns were sold at Broadway, Worcester, lately. Forty-one cows averaged £18 8s. 6d. each; seven bulls, £51 12s. 0d. The Third Earl of Warwickshire brought 83 guineas; Knightley Duchess, 120 guineas; Sweetheart 26th, 105 guineas; Royal Cambridge Charnier, 155 guineas; Bohemian Knightley, 120 guineas. The three latter were bought by Messrs. Richardson and Boswell to come to this continent.

HON. D. CHRISTIE will offer for sale at Paris, Ont., on June 23, some first-class Short-horns, of fashionable pedigree, and they never having been forced in any way, fit equally for the show-ring or for breeding. The list comprises some fifteen young bulls of the Athelstane, Louan, Seraphina, and other celebrated tribes; the females will number 35, of the Athelstane, Louan, Placida, Isabella, Josephine, Ianthie, Rosalie, Vanda, Mabel, Strawberry and other tribes.

The Dukes and Duchesses—Their Number, and Whereabouts.

The high prices made by the Short-horns designated as of the Bates-Duchess family have prompted the National Live Stock Journal to inquire as to the total number now in existence of what are claimed to be pure Dukes and Duchesses. With the aid of a gentleman who has large opportunities of being well informed, our cotemporary makes the following estimate:—

Total number of females in the United States, eleven; seven of which are owned by Mr. Alexander. How many of the remaining four are breeders we are unable to state; two of them, at least, are understood not to be.

There are six females in Canada, owned by Mr. Cochrane. In Great Britain there are understood to be about thirty-three females.

Of bulls, we have in the United States sixteen, in Canada two, and in Great Britain about twenty.

Table showing total numbers in the United States (27), Canada (8), and Great Britain (53).

In all, 88

Of these, ten cows in America, we believe, have the Lord George cross, and four in England the same; while six females in England have the Roscoe, and eight the Usurer cross; and Grand Duchesses, say ten, have Booth and other so-called outside crosses. There are two with the Lord George cross through 3rd Duke of Airdrie, and one, at least, with the Grand Turk cross.

Of the few so-called pure Duchesses, several are doubtful breeders.

Of the "strictly pure" bulls, the United States may claim four (one a doubtful breeder), and Great Britain three—seven in all.

It is estimated that there are seven Oxford bulls in the United States, and six females, some of the latter being doubtful breeders.

If any of our friends are able to correct the above in any particular, we shall be glad to hear from them.

THE SHORT-HORN BULL, STANLEY, of which last month's CANADA FARMER contained an illustration, has been sold by Mr. John Dryden, of Brooklyn, Ont., to Messrs. Grandy, Bethany.

SIX COWS AND HEIFERS of the Sanspareil family have lately been bought from Mr. Francis Lowell, of Galt, by Messrs. Stewart, of Lobo. Messrs. Stewart have also sold a three-year-old heifer of the same family to Mr. B. Sumner, of Connecticut, for \$1,000.

THE CEDAR GROVE HERD, of Kentucky, was recently enriched by the addition of the entire herd of shorthorns of Kirk & Son, of Ohio, forty-eight in number, and including Irene 15th, Cambridge Rose 3rd, and imp. Matilda.

AT UNDERLEY, Eng., lately, Eighth Duchess of Oncida produced a red bull calf to Third Duke of Gloster. The calf is the heifer bought at New York Mills sale, from Tenth Duchess of Geneva (also Lord Bective's) and by Fourth Duke of Geneva. The sire, bred by Mr. Cheney, and purchased at the last Gaddesby sale but one, was resold at the Underley sale in September last to Mr. Colman, of Stoke Park.

THE FAMOUS HERD OF SHORT-HORNS belonging to Messrs. Atkinson, of Peep, Scotland, was sold lately. The average price was £66, 19s. The highest priced animal was Justitia, which sold for 550 guineas, and a calf of that animal fetched 81 guineas. Among other prices were Butterfly, 318 guineas; St. Crispin, 240 guineas; Bracelet, 130 guineas; Florence, 105 guineas; Royal Killerby, 115 guineas. A roan calf, St. Crispin, brought 160 guineas.

MESSRS. GROOM, of Kentucky, have successfully brought across the Atlantic their recent Short-horn purchases in Great Britain. They comprise 31 head, 12 from the herd of Col. Kingscote, 6 from Mr. R. Pavin Davies, 8 from Mr. Allen, Knightly Hall, 2 from Lcney & Sons, and one each from Messrs. Perry, H. J. Sheldon and Martin. All of the animals are of pure Bates blood, some, says Dell's Messenger, about the purest Bates we had left in the country—for example, Roguish Eyes, Fidget 7th, and Sixth Duke of Kirklevington.

SALE OF SHORTHORNS IN AUSTRALIA.—At the sale of a draft from the herd of Mr. Richard Morton, of Mount Derrimut and Skelsmergh Hall, on February 23rd, by Messrs. Gibson and Co., of Melbourne, the following results were reached:—15 bulls averaged £452 18s.—£6,793 10s.; 21 cows and heifers averaged £372.—£7,812. Total £14,605 10s., or a general average of £495 13s. 3d. Earl of Geneva (31068), bred by Mr. Pavin Davies, in 1811, was knocked down to Robertson Brothers, for 1,650 gs.; Duke of Brunswick 6th, to Mr. E. Henty, for 660 gs.; Duke of Derrimut 15th, to Watt and Thompson, for 650 gs. The best cows were Roan Duchess by Royal Butterfly 22nd, sold for 790 gs., to Mr. S. Gardner; and Duchess of Brunswick, to Mr. Gardner, for 760 gs. The average at this sale was greater than has before been reached in Australia. Mr. Morton retains a magnificent herd still.

New Granges of Patrons of Husbandry.

The following is a list of the Granges organized in the Dominion since our last issue:—

Division Grange.

10. PEEL.—Guy Bell, Master; Luther Cheque, Sec'y.

Subordinate Granges.

148. CARLISLE, County of Wentworth.—Geo. Gattle, Master, Carlisle; Reubou Sparks, Secretary, Carlisle.

149. MOUNTAIN, County of Peel.—Richard Dick, Master, Cheltenham, Archibald Frank, Secretary, Cheltenham.

150. NORTHWESTERN, County of Halton.—John S. Lesh, Master, Georgetown; Alex. Sterratt, Secretary, Glen Williams.

151. ———, County of Kent.—James Laurie, Master, Charing Cross, Albert H. White, Secretary, Charing Cross.

152. TRIUMPH UNION, County of Perth.—Wm. Lang, Master, St. Mary's; Wm. Porter, Secretary, St. Mary's.

153. EDGAR, County of Simcoe.—Robert Richardson, Master, Edgar; Thos. S. Macleod, Secretary, Dalston.

154. EAST WHITBY, County of Ontario.—Joseph Langmaid, Master, Taunton; James C. Fox, Secretary, Foley.

155. ELDIVILLE, County of Huron.—Leonard Hunter, Master, Exeter, S. P. Halls, Secretary, Elmville.

156. ALLIANCE, County of Middlesex.—George Lethbridge, Master, Strathburn, John C. Dobe, Secretary, Strathburn.

157. FARMERS' UNION, County of Lambton.—Francis Hearne, Master, Watford; Robert Cran, Secretary, Watford.

158. WOODHILL GRANGE, County of Peel.—Thomas Ward, Master, Woodhill, Geo. H. Ward, Secretary, Woodhill.

159. GRANTON, County of ———. Philip Mowbray, Master, Granton; James Grant, Secretary, Granton.

160. EGLMONT, County of Grey.—Jas. Rogers, Master, Dismore, Thomas Fergus, Secretary, Dismore.

161. SULFORD, County of Oxford.—William B. Nollis, Master, Sulford; James Dumpty, Secretary, Sulford.

162. LIVINGSTON, County of Bruce.—George Armstrong, Master, Teeswater; Robert Watson, Secretary, Teeswater.

163. KILBRIDE, County of Halton.—John Agnew Master, Kilbride; Thomas Rastel, Secretary, Lowville.

164. QUEEN'S VALLEY, County of Grey.—Thomas Ellis, Master, Kimberley, John Hurlburt, Secretary, Kimberley.

165. OLINDA, County of Essex.—John H. Stewart, Master, Olinda; A. S. Fox, Secretary, Olinda.

166. APPLE GROVE, County of Elgin.—David King, Master, St. Thomas; George Potticay, Secy., St. Thomas.

167. SYDENHAM VALLEY, County of Kent.—Wm. Bolton Master, Dresden; D. F. Danard, Secretary, Dresden.

168. BIRCH GRANGE, County of ———. Joseph Ferguson, Master, Birch; Robert Hobbs, Secretary.

169. CHATHAM CENTRE, County of Kent.—David Picket, Master, Appledore, Thos. McKerrall, Secy., Appledore.

170. PHENIX, County of Middlesex.—Hector McFarlane, Master, Glencoe; B. J. Donaldson, Secy., Glencoe.

171. LANGSTAFF, County of York.—John Duncan, Master, Richmond Hill; C. L. Hollingshead, Secretary, Richmond Hill.

172. THAMES ROAD, County of Huron.—Robert Gardner, Master, Farquhar; George Hickney, Secretary, Farquhar.

173. KNOWLTON, County of Brome.—Levi R. Whitman, Master, Knowlton, A. E. Kimball, Secretary, Knowlton.

THE DEATH IS ANNOUNCED OF Mr. Willoughby Flood, of Derbyshire. He was a well-known agriculturist, and was one of the most distinguished of English agricultural writers.

A WEST SPRINGFIELD, MASS., FARMER says he would have been better off if he had never raised a pound of tobacco. If the fertilizers had been applied to other crops, they would have paid better.

A 4,100 POUND OX.—Mr. T. Seitz, near Carlisle, Pa., owns an ox which weighs 4,100 pounds. A gentleman from Harrisburg recently offered him \$1,000 cash for this animal, with the design to take him from place to place on trucks for exhibition, until the Centennial takes place in Philadelphia.

ON DECEMBER 16th and 17th last, Gen. Gutar, of Columbia, Mo., sold at public sale 47 Berkshire hogs for \$1,022—an average of \$23 76 per head. Four years ago Gen. Gutar imported three animals at an expense of \$1,153. Since then he has sold 341 head, some of them for \$100 each, has taken over \$1,000 in premiums, and has a good stock left.

A CROP OF SWEDS TURNIPS which yielded 463 English tons per acre, was grown last season by Mr. Whittingham, of Altrincham. The land was drained marsh, ploughed in drills 25 inches apart, and fertilized with 20 tons of lime manure, 336 pounds of ground bone, and 163 pounds of guano per acre. The seed had been grown upon the farm from well-selected bulbs, as had been the custom for many years.

Seeds.

The Early Vermont Not the Early Rose.

The close resemblance between the Early Rose and the Early Vermont has deceived at least one CANADA FARMER reader into imagining that those two potatoes are one and the same tuber under an alias. If that reader is not satisfied with the reply he drew from another reader, he may congratulate himself that he is not the only one who has thought as he did. Dr. Hexamer says of the Early Vermont, in the *New York Tribune*, that "by its close resemblance to the Early Rose, it has elicited more controversy and argument than any other new potato. Many persons allowed their temper to get ruffled because they could see no difference between the two kinds, while their neighbors did, and because with them they did not mature as easily as with others. That the Early Vermont is a distinct seedling, raised by Mr. George W. Woodhouse of West Rutland, Vt., and not the Early Rose under an alias, is as irrefutably settled in the history of potatoes as it is generally accepted that the battle at Bunker Hill and the capture of Fort Sumter are distinct historical events." And when an American, in those Centennial days, asseverates a thing by Bunker Hill, the question in dispute ought to be considered settled.

The Smith Wheat Again.

EDITOR CANADA FARMER.—In your April number you said, in answer to an enquirer, that the Smith wheat was all disposed of. I was in Thornbury on the 27th of April, and I learned from a merchant there that the whole of the wheat had been shipped back by the purchaser, and that it had arrived at Thornbury the day before. I learn that it is the intention of the proprietor to give it, free, to some of the best farmers round, in lots of five to ten bushels, he promising to give them one dollar per bushel for the entire product. Thus its merits or demerits will be fairly tested during the coming season.

I was talking, on the same day, with a man who told me that his father had grown the same wheat as much as twenty seven years ago, and that he did not consider it a valuable variety, but that the grain had a very fine appearance. However, we shall know more about it before another year.

The spring is very backward here, no seeding done yet, and to day we have a regular snow storm and the ground was wet before.

FRANCIS BOLE

St. Vincent, May 1.

Raising Potatoes from Seed.

EDITOR CANADA FARMER.—It appears quite evident that potatoes will run out if not properly managed. I understand that planting the seed that grows on the tops of the vines makes a renewal. I also understand that grafting potatoes sometimes produces a good effect. But, if potatoes will run out, will not the seed that grows on the tops of the vines be run out also? It is my opinion that by cutting potatoes properly, not using either extra large ones or small ones, and changing the place of planting when it is necessary, they may be made to increase in their good qualities as well as decrease. Perhaps further information will convince me that I am wrong; if so, I will be thankful for the knowledge.

J. E.

Oneida, Ont.

It is beyond a doubt that varieties will run out speedily, if neglected. It is also true that by change of soil and location, and by careful culture, running out may be postponed indefinitely, or that the variety may be improved. We should not advise any farmer who depends upon his farm for his subsistence, to invest much time in grafting potatoes. Still, there is a great deal to be learnt by experiments carried on at odd times, to say nothing of the inquiring spirit which is fostered. It is possible that a farmer may originate a superior variety by hybridizing potatoes—and in that case, he will "strike it."

ANOTHER SWINDLE.—Either in ignorance or with intent to defraud, probably the latter, itinerant peddlars, on the other side, are selling plants of the Charles Downing strawberry which they state makes no runners—the fact being that the Charles Downing is particularly good at

making runners. These rarity-vendors will be around here doubtless. Let them alone, unless you wish to be robbed. The Charles Downing is a good variety, but is obtainable from every nurseryman. It is in order to repeat our caution not to deal with the peripatetic humbugs who buy up the refuse of nursery-stock and sell it out at a greater figure than the selected specimens have realized.

Some Seed-Cleaning Experiments.

The *Maine Farmer* gives some figures which should cause those farmers who neglect to clean their seed to alter their ways. It says:—

We have before us the results of the cleaning of barley and wheat, by the aid of one of the most perfect grain separators we have ever seen—which we believe have never before been published. The first was a bushel of barley, weighing 46 lbs., which was separated with the following results, viz. from the bushel, 28 lbs. of plump seed barley was obtained, 13 lbs. of light barley and oats, 3 lbs. of buckwheat, and one pound of seeds of weeds. The second was a bushel of wheat weighing 58 lbs., cleaned with the following results, viz. from this bushel 34 lbs. of No. 1, or heavy seed wheat, were obtained, 12 lbs. of No. 2, or middling (light) wheat, 6 lbs. of No. 3 wheat (very small, pinched kernels) and junk or cockle, 5 lbs. of oats and barley, and 1 pound of tangle weed and other foul seeds.

As both the above samples of grain were taken from the ordinary crops grown on a first-class farm, it will be seen how large a proportion of poor, light grain, as well as seeds of foul and noxious plants, were being raised and propagated by the use as seed of the barley and wheat raised. Even if the oats and barley and wheat were in every instance cleaned or washed before being sown—which, however, is not the case—the seeds of weeds are propagated through the manure hauled out upon the land, and our fields are by this means overrun with useless plants and weeds. So if the farmer would not only raise profitable crops of heavy grain, but keep his farm clean and free from weeds, he must be careful to sow only good grain, thoroughly cleansed, free from worthless and foul seed.

A Potato that Resists the Colorado Beetle.

A. Jackson, of Frederick Co., Md., communicates the following interesting facts to the *American Farmer*, which he says can be attested by the sworn testimony of two or his laborers.—About five years ago he received from New Jersey a peculiar kind of a red potato, under the name of Siberian Red. It proved to be a very prolific bearer, and of a monstrous size, very moaly and wholesome for the table, though some purple streaks would occasionally run through the tubers. Last summer he planted them in hills four feet apart, between young grape vines which stood eight feet by eight feet, and raised on one acre a little better than one hundred bushels of magnificent potatoes.

He fertilized the hills by mixing lime with ten per cent. of salt, and mixing old cow manure with about ten per cent. of said lime and salt compound. He used a good shovelful of it in every hill, and embedded it with the ground (clay soil) by digging. The result, he says, was astonishing. When the potato bug (which had then appeared in myriads) had eaten off a vine, presently two or more vines would shoot up, keeping on growing until the November frosts killed them. Most curious of all, they bore here and there small potatoes (not seed balls) on the vines. One remarkable hill yielded forty-five average-sized potatoes. All his other kinds, as Early Rose, Peach Blow, Early Goderich, though treated in the same manner, were an utter failure.

PERENNIAL POTATOES.—English journals state (but we do not vouch for the truth of it) that M. Lemer, of Paris, has discovered a method of cultivating potatoes by which they multiply indefinitely, the sap in winter being engaged performing underground work, increasing the size of the tuber, and improving its flavor.

THE EARLIEST TOMATO.—A *Rural New Yorker* correspondent says that with him in Pennsylvania, the Canada Victor is the earliest tomato. He has raised it for two years and found it to be much earlier than the other varieties. "It is an excellent cropper, and when the fruit ripens it has no green round the stem, as with some other varieties. The fruit is of large size, symmetrical and very handsome. Another good point in this tomato is that it is not apt to crack open when rained upon—a great fault with many kinds otherwise good."

ONION CULTURE.—The *Maine Farmer* says:—The Early Red stands highest among varieties. It is a very fine early sort, handsomely shaped, thick, smooth skinned, fine flavored and solid, ripens by the end of July—a sure cropper. The Large Red Watersfield is very large, deep red, thick, fine-grained, tender and of a sweet pleasant flavor, fine keeper, very profitable and perhaps more extensively grown than any other. It takes from four to six pounds of onion-seed to the acre, if sown in drills, which is the best manner to sow them. A good coat of wood ashes must be well worked in before sowing, and another spread on the surface after sowing.

Correspondence.

FRENCH HORSES.—Reader, Scott Township, can buy Canadian horses, in this Province at from \$200 to \$1,000. The breed is becoming extinct; the few left showing some good paternal qualities, but on the whole too much mongrel. Imported Percherons have, of late years, been introduced by some of our more enterprising French Canadians. I have seen some excellent stock from this breed, others again say they are very liable to disease. For my own part, I use only the medium sized Clyde for farming purposes, and find them more reliable, and with less tendency to unsoundness. They also (as a general rule,) command the highest price in the Montreal Market. — *Wm. Mackay, M. D., Lower Laclinc, Quebec.*

WORK ON AGRICULTURAL CHEMISTRY.—**POST AUGER.**—H. A. S., Vittoria,—Johnston's "Agricultural Chemistry," \$1 75; same author's "Elements of Agricultural Chemistry," \$1 50; "Agricultural Chemical Analysis," by Prof. Caldwell, of Cornell, \$2 00; Stockhardt's "Agricultural Chemistry," \$1 50, are among the best of the low-priced works. A more expensive and scientific one is Morfit's "Treatise on Fertilizers," \$25 00. There are several good post-augers in use, with which Mr. Rennie, of Toronto, or any other implement dealer can supply you. The post scoop is coming into general use, and possesses some advantages over the auger in that it can be worked in ground too hard for the auger to be operated in. In using them, the ground is loosened with a crowbar, and the soil is then withdrawn with the scoop. A great deal of work can be got through with it.

SICK AYRSHIRE.—W. F., Greenbush, Ont.—Your letter was delayed in the mails and we did not get it until too late for our last issue. The cow will now have calved, and the trouble will be over. Probably the food you gave her was of too stimulating a character, heating her blood to too great a degree. If the horse has not recovered, send a full description of his symptoms.

STONE DRAINS IN ORCHARDS.—Having noticed that Greeley and others have condemned stone drains for orchards would you please give your opinion on the subject. Would a stone drain in the centre, between rows of apple trees thirty feet apart, be apt to get choked or injured by the roots of the trees extending to the drain?—*A. McL., Tecumseh.*

Our opinion on the subject of stone drains in orchards is, that orchards should not be located in situations which would want a stone drain, if it can be avoided. If there is no choice in the situation, by all means put in the stone drain as large as possible. In time the roots will extend to the drain, and the larger the drain is the longer it will be in getting choked.

HOLLOW-HORN, SO-CALLED.—J. G., Elderslie, Ont.—The peculiar low state of cattle called "hollow-horn," is produced by bad and insufficient feeding, and, to repeat a time-honored joke, should rather be called "hollow-belly." Boring the horns, slitting the tail, etc., as are sometimes practised, are just so much nonsense and cruelty. The real treatment should be warm shelter, warm mashes and good nursing. The processes to which the horns are united are always hollow, and it is ignorance of this fact that deceives the "cow-doctors" upon whom some farmers are apt to place reliance. The coldness of the horns in this form of disease shows that the circulation is weak and depressed.

A COMPLIMENT FROM OVER THE LINE.—Mr. Benj. B. Hopkins of Griggsville, Ill., in enclosing us a dollar in American currency for a year's subscription to the CANADA FARMER says:—"If not enough money, I will send more by return mail. If you do not send the FARMER, I guess I have got my dollar's worth in the one number you sent me for January 1875."

STOCK JOURNALS.—G. R. H., Guelph, Ont.—The *National Live Stock Journal* is published in Chicago, and the subscription price is \$2.15 per annum, post-paid. The *Live Stock Journal* is published at Buffalo, at \$1.60 per annum, post-paid. Of course, these prices are in American currency.

Miscellaneous.

The Champion Reaper.

The busy season with the Champion people has now fairly begun, and the energy with which they are accustomed to push forward their operations, is beginning to tell in substantial results. It is yet nearly three months till harvest time, but notwithstanding that fact, large shipments of Champion reapers and mowers, to nearly all portions and quarters of the globe, are now being made almost daily. The demand for this popular machine is greater this year than it has ever been before, though for many seasons past it has stood, by the almost unanimous verdict of American farmers, at the head of all harvesters. To meet this increased demand, the manufacturers are now taxing their energies and facilities to the utmost. That the *thirty thousand machines*, which will be ready for the harvest of 1875, will fall under, rather than overreach the demand is now evident.

This morning (Friday, April 2nd) the largest single shipment of Agricultural implements ever witnessed in the United States or the world, took place from the yard and warehouses of the Champion Machine Company. Since Monday morning last a large force of workmen, detailed for that purpose, have been engaged in loading machines preparatory to shipment. The *forty-fourth* car was loaded late last evening, and all things were pronounced ready for the great shipment.

The forty-four cars contained, in all, *one thousand machines* exactly. To avoid the suspicion which ordinarily attaches to round numbers, the effort was made to load on one more machine, as the orders of several of the parties to whom the machines were shipped, were not wholly filled. But the room was lacking, so that the number rested at the even thousand.

The cars were divided into two trains, which started out together.

It had previously been noised about that the New Champion folks were going to outdo all former efforts in a huge shipment of machines that would astonish the natives along the lines of the various roads over which the trains would pass, a crowd of citizens collected, early in the morning, at the manufactory of the Champion Machine Company to witness the spectacle, and it was well worth their while.

It took some little time to get the trains made up, but by half-past nine o'clock they were ready, and the first one at once began to pull out. The scene presented just before the departure of the trains was one to which a high degree of animation was attached. The cars, locomotives and each caboose were gaily decorated with flags, while large, handsomely printed cards, bearing a fine illustration of the Champion machine at work in the field, and the letters "From the Champion Machine Company, Ohio to" (here followed the name or names of the agent or agents, and the town or the city), were fastened to the side of each car. It was a scene that every citizen in Springfield might behold with pleasure, for it was a very substantial indication of the continued prosperity which an enterprise, which has taken a conspicuous place among the foremost manufacturing interests of the world, and which has contributed so largely to the upbuilding of our flourishing city, enjoys.

As above stated, the number of machines was exactly one thousand. Their average value is \$175, which makes the value of the shipment \$175,000. Think of it; it will bear thinking about.—*Springfield, O., Republican.*

Fish-Culture and Fish Protection.

We resume our extracts from Mr. Wilmot's essay read to the American Fish-culturists' Association:

It does not necessarily follow that the female shall be accompanied by the male in the act of spawning. It frequently happens that whilst she may be deeply engaged in her work, several male fish will be fighting together to gain the superiority of place. Whilst thus engaged, the female is depositing her ova without the vivifying fluid coming in contact with them. Whilst this operation of laying the ova is going on, the bed is generally surrounded by various kinds of small, predacious fish, watching every opportunity to prey upon the eggs.

Trout cause great havoc in this way, and young salmon (parry), chubs, eels, and almost every other kind of small fish lie in wait to perform the same act of destruction of the ova.

Those of the eggs that shall have escaped these perils will be found embedded in the gravel, where they remain (should they escape all other dangers) from October till the following April or May. Various kinds of insects, water bugs, and innumerable aquatic animals, whilst groping about for food, come upon these salmon beds, and perforating the soft, filmy covering of the egg, with their needle-like teeth and sharp claws destroy vast numbers of them.

Add to this a great number that are lost by decay, for all those which have not received the vivifying fluid die, and, becoming putrid, there grows upon them a species of fungus, which, spreading its grasping web, catches in its

poisonous folds any adjoining eggs, killing them at once. This works great destruction to the semi-incubated egg. Clusters of a hundred and more are thus sometimes found in the crevices of the larger gravel in a putrid state. This great scourge of the ova is very difficult to overcome, even in the purest water, and where the greatest attention is given to prevent its growth.

Another great loss of the ova takes place from the formation of anchor ice. The eggs thus having lost their covering of water, become frozen and die. Great destruction is also caused by the shifting and shoving of ice from the effects of heavy freshets. Whole sections where salmon beds had been made are sometimes swept away.

The remnant of the eggs which may have escaped destruction, will in April and May hatch out and become young fry. At this time they are helpless in the extreme, lying prone on their sides, with a large bag or umbilical sac attached to their bodies. In this stage of their existence they remain about five or six weeks, until by a process of absorption, brought about by the increased warmth of the water in spring, the sac hitherto attached to the body disappears, and the little fish, now symmetrically formed, begin to roam about in a lively manner in search of food. From the time of emerging from the shell up to the present time they are still an easy prey for their numerous enemies.

The numerous difficulties above enumerated are by no means all that have to be encountered. There is to be added the destruction by aquatic birds, polluted water, deleterious substances of various kinds, such as saw-dust and rubbish from saw mills, washings from barn yards and turnpike roads, natural and artificial manures, and other foreign substances used upon the soil in farming, draining, etc.—all flowing more or less at times into the streams, and settling upon these beds, to pollute the water and to cause immense losses to fish eggs, and also to the newly hatched out, and as yet undeveloped and very delicate fry.

Of the eggs thus deposited, scarcely one in a hundred ever produces a living fish. Yet withal, fish are so prolific that there would still be enough, were it not for the ruthless and barbarous manner in which they are killed by man, irrespective of the seasons in which they are foul and unclean for food, and of the time also in which they are in the act of laying their eggs for producing their young.

Having now shown the manner in which the ova are laid by the parent fish in the natural way, and having described the numerous sources from which great destruction results to the egg by that system, it will be necessary to fully explain the method adopted for the artificial propagation of fish.

For this purpose we will commence at the time at which the parent fish shall have reached the spawning grounds in the river or other water, and when the ova and milt have become mature. The eggs are then taken from the female by the operator in as gentle and careful a manner as possible. There are three methods practiced in securing the adult fish, male and female, for this purpose. One is to catch them by means of nets whilst they are upon the shallows, and if found ripe at the time to then and there carefully extract the ova and milt from them. This will be found a difficult procedure, both in the netting of the fish and also in the uncertainty of afterwards finding them perfectly ripe for spawning, and should not be adopted unless it be impossible to procure them by other means. Another plan is to catch such numbers of the adult fish as may be required at the time of their migration up rivers during the summer months, by means of small meshed nets, and carefully put them into ponds or enclosures, there securely to be kept until they become mature for laying their eggs. The other method, which from the beginning has been used at the Newcastle establishments in Ontario, is by erecting a reception house alongside of the stream (through which a sufficient body of water is made to pass), into which the parent fish, on their journey up stream, are enticed to enter through peculiarly formed traps, from whence they cannot return or escape.

[We are compelled, by considerations of space, to reserve Mr. Wilmot's description of the way of conducting the hatching house, till next month].

TO CLEAR MUDDY WATER.—A piece of alum as big as a hickory nut will render clear a pail of muddy water. Dissolve the alum, stir and allow the impurities to settle.

TO CLEAN CIDER BARRELS.—Pour in lime water, and then insert a trace chain through the bung hole, remembering to fasten a strong cord on the chain so as to pull it out again. Shake the barrel until all the mould inside is rubbed off. Rinse with water, and finally pour in a little whisky.

PAINTING OLD BUILDINGS.—An inexpensive but durable method of painting old buildings is as follows: First give them a coat of crude petroleum, which is the oil as it comes from the wells, and which can be procured for four or five dollars per barrel. Then mix one pound of "metallic paint," which is brown or red hematite iron and finely ground, to one quart of linseed oil, and apply this over the petroleum coat. The petroleum sinks into the wood, and makes a groundwork for the iron and oil paint. The color of the iron paint is a dark reddish brown, and is not at all disagreeable, it is a color not easily soiled, very durable, and is fire-proof.

Flukes.

In late numbers of the CANADA FARMER, we have touched upon the subject of flukes in deer and sheep. The whole subject of these entozoa has been profoundly investigated by Dr. T. S. Cobbold, P. R. S. He lately read a paper before the London Linnæan Society, on the Structure, Affinities, and Probable Source of the Human Fluke (intestinal worm), Distoma crassum. The parasite was discovered by Prof. Busk, about thirty years ago. The specimens lately brought under Dr. Cobbold's notice were secured from two patients,—a missionary and his wife who had resided four years at Ningpo, China, where they had freely partaken of fish, oysters, and salads. Seven specimens of fluke were obtained,—two from the lady, and five from her husband. Only two of these supplied the observer with new facts respecting the organization of the animal, and the best one of the two has since been deposited in the University Museum at Oxford. From a survey of all the testimony in point Dr. Cobbold concludes that the occurrence of the Distoma crassum in the cases under observation was to be referred to the consumption by the missionary and his wife of Ningpo oysters, or of fish insufficiently cooked.

The Distoma are trematode worms, and are called flukes from their resemblance in form to flukes, or flounders. They are not parasitic throughout their lives, but at times inhabit either open waters or dewy pastures. The Distoma hepaticum is common in sheep, causing the disease called Rot. This species is generally less than an inch in length, and is found in the liver, where it feeds on the bile. It is sometimes found in the human liver and vena portæ. It enters while in the larval state, into the bodies of molluscs and of aquatic insect larvae, and thence is conveyed to the stomachs of animals feeding on herbage, and in this situation reaches maturity. A small species of this genus, the D. hæmatobium, is common in Egypt, in Africa, and along the Mauritius. In 363 examinations of the bodies of Egyptians after death, Griesinger found the parasite occurring in 117 cases. A small species, D. ophthalmobium, has been found in the lens of the human eye.

Dr. Cobbold recognizes 341 species of flukes, of which 126 belong to fishes, 47 to reptiles, 168 to birds, 58 to mammals, and five to the invertebrata. At the lowest estimate, he assumes that the order Distomida includes 400 species. The genus Distoma contains many species, infesting in their mature state different animals, and effecting a lodgment in different portions of the body. Some species locate themselves in the wrinkled membrane around the eyes of birds.

THERE ARE NOW seventy associations for the protection of game and fish in the United States and Canada, comprising a membership of over 5,000, who are chiefly gentlemen of influence and enthusiasts in the work they have undertaken—to prevent useless slaughter of game, and to restock our depleted streams with fish.

TRUFFLES.—A new and successful enterprise in agriculture is growing up in the South of France. Large tracts of land which have hitherto been comparatively worthless for all purposes of cultivation, are now being planted with the variety of oak trees beneath which truffles are generally found. It is expected that, with this treatment, land which has lately been sold at £5 per acre will produce a crop of truffles worth £20 every year. The experiment has been extensively tried in the Department of Vancluse, where, in the course of the last twenty years, 150,000 acres that were absolutely unproductive have been devoted to the culture of truffles, and are yielding a rich return.

HOW TO EXTRACT A FISH-HOOK.—The following is from the Dover, N. H., Enquirer—"Some eight years ago a lad of thirteen, a son of Charles E. Meyers, a well known citizen of Portsmouth, while fishing from one of the wharves of that city, caught a fish-hook in the fore-finger of the right hand, near the nail, drawing it into the bend of the hook. His father saw at once that the only thing to be done was to open the finger on a line with the hook and take it out, but preferred to call in their family physician to do it. After looking at it for a moment, the doctor, by a sudden twist, wrenched the hook from the finger, minus the barb and point. The parents were justly indignant at such treatment, and insisted that the hook was not all removed, while the boy came near fainting from extreme anguish. The doctor, however, insisted that no inconvenience would result, and dressed the finger in some simple and safe manner, and in due time the wound healed. But the finger and arm troubled him for a long time. After a year or two the lad's health had so far failed as to become a subject of serious alarm to his friends, he being subject to frequent and alarming fainting fits, and other spasmodic affections or symptoms. The state of affairs continued for years, with more or less intensity, until a year or two ago, when the boy's health became nearly or quite restored. In the spring of 1874, the young man, while dressing himself one morning, tore a pimple from his left shoulder, and on examining it, he drew from the flesh the point of the hook which seven years before was imbedded in a finger on the opposite side of his body."

FIRE-RESISTING GLUE.—A handful of quicklime, mixed in four ounces of linseed oil, and boiled to a good thickness, makes, when spread on plates and hardened, a glue which can be used in the ordinary way, but will resist fire.

A SARCASTIC CORRESPONDENT of the New York Tribune tells that journal "that one of the Agricultural Colleges in New-England can scarcely be said to have done the State no service, since a part of its land was utilized last year as 'pasture for the President's cow.'"

DR. WETHERELL, of The Boston Cultivator, remarks that "since eggs were bought and sold by weight, a great change has come over the trade" in certain portions of Massachusetts. "Now the small ones are mostly given to the children and hired help"—which shows the influence of circumstances.

TO FIND THE CONTENTS OF A BOX.—An approximate rule, doubtless sufficiently accurate for most practical purposes, is given for the measurement of grain, fruit, herbs, &c., in house or box, as follows: find the length, breadth, and depth, multiply them together, annex two ciphers, and divide the product by 124; the result will be the number of bushels, and the fractional remainder, if any, may be reduced to pecks and quarts.

MEDICINAL RHUBARB.—It is only a very short time ago since it was supposed that the origin of the true medicinal Rhubarb of commerce had been finally settled, and was the product of Rheum officinale, recently figured in the "Botanical Magazine," and admitted in Fluckiger and Hanbury's "Pharmacographia"; and already this comfortable arrangement has been disturbed. In a recent number of Regel's "Gartenflora" there is a figure of Rheum patulum var. tanguticum, which is described as the "most genuine amongst genuine" Rhubarbs, and as the sort imported into Siberia by way of Kjachta. It was raised from seed collected by Mr. Przewalski in south-west China, on the high plateau bordering on the high lands of Thibet.

WORKING UP RAW MATERIAL.—Farming is the changing of raw material (manure) into grass and grain, and thence into pork, beef, wool, &c. When the land is purchased, it is this raw material (fertility) that is paid for; that alone is the value. The rest is mere sand, or clay, or rock. The object of the farmer, then, should be, to secure his material as cheap as he can, and use as much as he can, always keeping his machine, the farm, in good working order, mellow, well drained and clean. Instead of this we are too apt to abuse the machine. The object of the farmer, then, must always be manure, fertility,—how he can get this raw material cheapest, and work it best into grain, grass, &c., and thence into other products, such as are of most advantage to him.—Country Gentleman.

EPH'S COCOA.—GRATEFUL AND COMFORTING.—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well selected cocoa, Mr. Epps has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack, wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame." (West Service Gazette) Made simply with Boiling Water or Milk. Each packet is labelled—"JAMES EPPS & CO., Homœopathic Chemist, 48 Threadneedle Street, and 170 Piccadilly; Works, Euston Road and Camden Town, London."

MANUFACTURE OF COCOA.—"We will now give an account of the process adopted by Messrs. James Epps & Co., Homœopathic Chemists, and manufacturers of dietetic articles, at their works in the Euston Road, London."—See article in Cassell's Household Guide.

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