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THE CANADA FARMER.

VOL. XIII.—No. 4.
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Agriculture.

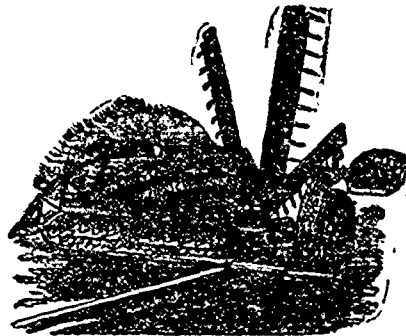
Prepared Fertilizers.

A ton of ordinary barnyard manure, roughly analysed, contains but comparatively little plant food. Its constituents are about 1,460 lbs. of water, 420 lbs. or thereabouts of other organic matter, 75 lbs. of useless ash, and the balance, 45 lbs., of the essential element, plant food. Even this average is perhaps too favorable, 30 to 35 lbs. per ton of the last mentioned coming nearer to the rule. To this consideration another must be added; even the small quantity stated proves of but little, if any, benefit to vegetation until it has become thoroughly rotten and mingled with the soil. Yet how eagerly is barnyard manure sought after, and even purchased at fair prices by farmers living in proximity to towns and cities. Now, it is not our intention to disparage the use of this article,—very far from it. Wherever it can be had, by all means let it be utilized in abundance. The increased returns in every department of agriculture will more than justify the outlay. Our object is rather to direct more attention to the use of prepared fertilizers which are now manufactured in great variety, and may be had in any quantity at a comparatively small cost. We say a comparatively small cost, because, though they are of course much more expensive, ton for ton, than ordinary manure, yet, when prepared under the direction of a good analytical chemist,—and their quality every farmer can test for himself before purchasing extensively,—these compounds can be made almost free from water, and their ingredients so adjusted that 100 or 150 lbs. of the marketable article will contain all the fertilizing elements of a ton of common manure. A correspondent to the *Rural New Yorker*, writing recently upon this subject, gives Prof. Liebig's analysis of 100 lbs. of ammoniated bone superphosphate as follows: good, available plant food, 15 lbs.; water, less than 13 lbs. Referring also to his method of testing these fertilizers, and it is certainly a very simple one, the same writer goes on: Several weeks before planting time I procured a small quantity of superphosphate. I filled two 8-inch pots (boxes would answer) with soil from a field which I intended for oats. With the soil in one pot I mixed an ounce of the fertilizer. I planted eight plump oat kernels in each pot, and then set them in a warm window and kept the earth moist. When the plants were about three inches high I pulled up the smallest, leaving the best four plants in each. Before the time for sowing my oats I measured the plants accurately, and found those in the fertilized soil to average 15 inches in height, the others 10 inches, each dimension of the former being fully 1½ times that of the latter, making the bulk or weight 3½ times as great. From this experiment I inferred that it would be a good investment to use the fertilizer, and the result justified the inference. For every dollar's worth of fertilizer used I got, in increased yield, \$3 worth of oats at 40 cents a bushel, and a corresponding increase in straw.

A Light and Cheap Reaper.

An important desideratum in the construction of all classes of implements now-a-days is to have them made just as light, consistent with durability, as they were formerly made heavy. The days of cumbersome, unwieldy machinery are about over, in this country at least. For many years back our manufacturers, from the lightest scuffer to the heaviest thrasher, showed in this respect a marked contrast to those of Great Britain, and of late they might be similarly contrasted with their former selves, that is, the implements of to-day are, generally speaking, much lighter, yet equally if not more serviceable, than the same class fifteen and twenty years ago. The ordinary garden hoe of that latter period weighed from 5 to 8 lbs. Those now in use will not average 2 pounds, yet they are equally serviceable and much more easily handled. Similar remarks

are applicable to nearly all farming utensils now in use. The selection of better material for manufacture permits of a much lighter construction, ensures equal durability, and affords a striking comparative degree of facility in working. For some years the cutting and other qualities of our Canadian reapers have been brought to such perfection that competition among makers turned largely on the draught. Dynamometers were in vogue at every successive trial and in most cases they settled questions that could not be settled in any other way. Ordinary machines weighed from 1,200 to 1,500 lbs., and their draught was considered commendable if it fell considerably below a fourth part of their weight. People, however, were not satisfied with that draught—at least their horses were not—and consequently the great inventive struggle of the day was to produce something new with a decisive decline in its drawing qualities. The Boyce reaper, which is here illustrated, seems to have met this condition. It is certainly a marvel of lightness, considering the work it has to perform, weighing only 450 pounds, and with a draught of little over 100 pounds. It has been pretty thoroughly tested too, and found to work quite successfully even in heavily ridged clay lands with lodged grain, and heavy grass bottoms. Its main points of excellence, those upon which its claims to durability rest, are the first quality of materials, wood, iron and steel, from which it is made. The frame is cast in one piece, the drive-wheel axle only passing through a journal in the iron frame. To prevent



obstruction to the gearing, a shield extends from the lower side of the frame to the wheel, and everything is protected from dust.

The journal is fast to the wheel, and passes through its bearing far enough to receive into the end of it, the rod which carries the motion to the rake, and which is attached to the rake-gearing by a universal joint, these connections being all in a direct line with the journal. The shipper lever to throw the machine in or out of gear, is close to the driver's feet upon the foot-rest and easy to control. The telling lever which performs the double part of elevating or depressing the points of the fingers, and of binding the rods which unite the two parts of the simple hinge joint, is at the right of and in easy reach of the driver.

The tongue or pole constitutes, in fact, all the wood in the frame-work of the machine, except the driver's seat, this being fastened to that part of the tongue which extends back to the journal bearing. With the weight of the driver and seat upon one side the bearing, which acts as a fulcrum, the neck-yoke and whiffle-trees upon the other, the tongue is evenly balanced, and no weight rests upon the necks of the horses. The guards are 3-inch malleable, with cast steel ledger plate. The knives are a 3-inch section, riveted to a steel back forming a very light and strong knife. The whole cutting apparatus making the best known form at present in use for either mowing or reaping.

Leaves from Farming Experience—No. 7.

Farmers appear to believe that if lime is given, or any other article, such as plaster, or salt, no more is required. This is a mistake. Seven different substances are wanted, and four more in smaller quantities, to make up a fertile soil. Soil well supplied with all the inorganic substances necessary, will absorb nitric acid and carbon from the atmosphere, in large quantities; but decayed vegetable substances and ammonia are of great service to start a

plant with a strong broad leaf; after that it will be supplied from the air. A fair topdressing for grass is 50 lbs. superphosphate of lime, ammoniated; 100 lbs. plaster; 100 lbs. salt; 30 lbs. Pearl ash. For turnip, 200 lbs. salt; mangolds, 600 lbs. salt. I used 33 pounds sal-ammoniac mixed with bone dust, ashes and plaster, per acre, with profit. There was no ammoniated phosphate of lime at that time. These dressings were sowed after the crop was harrowed. If the ground was dry it got one stroke of the harrow lightly, if it got none wet.

The value of manure depends on the food of the animal. Many farmers purchase linseed cake, as much for the manure as for the food. I did not summer-fallow unless when draining the field. Corn, potatoes, or turnips will pay rent and work, also a part of the manure, and the field may be made clean. It may be less trouble to clean land by fallowing, but it is also less profitable. I had two cowhouses: Having tried many ways of feeding and preparing their food, the following method was supposed best: A box was made of 1½ inch grooved and tongued boards, large enough to contain a day's food for all the cows in one house. The hay was cut fine; 30 lbs. of cut hay, 6 lbs. oats or barley ground, 2 lbs. peameal, 25 lbs. turnips cut very thin, 2 oz salt, all mixed and saturated with water, as much as it would absorb, were put in the box for each cow. There are three such boxes for each house. The hay is pressed slightly, and in about forty hours it will heat a little. Then begin to feed it to the cattle. It should be all used in one day, and the box swept or rubbed out to prevent moulding. I use also bran in place of oats or peas, to regulate the cattle's bowels. The cost is about \$68 for each cow. That cow should give at least 7,775 pounds of milk in the year; 777 lbs. cheese at 11½c..... \$87 36
A calf, \$1.50; whey, \$2.50; butter, \$5..... 9 00

Produce of 64 cows at \$96.36 each.....	\$6,167 04
Seven fat cows at \$75 each.....	525 00
	<hr/>
Cost of food for 64 cows at \$68 each.....	\$4,352
Attendance and cheese making.....	940
Seven heifers or young cows at \$34.....	238
	<hr/>
	\$5,330 00

Leaving a balance in favor of cheese.....	\$1,162 04
Value of farm produce after feeding 64 cows....	2,453 00
Balance of profit on farming.....	2,467 00

Gross yearly profits.....\$6,082 04

There will be about 800 loads manure at \$1.50. The charge for manure is 60 tons straw used for bedding to absorb the urine.

Bell's Corners, Ont.

J. ROBERTSON.

(Continued next month).

Grain-Bins—Waggon Wheels—Parsnips—Farmers' Wives.

EDITOR CANADA FARMER.—The FARMER for February has just reached me and, as usual, is filled with interesting and valuable matter. On some of the articles I must beg leave to make a few remarks. As for the "Grain house" described on the 21st page, I may remark that it is by no means rat-proof, as these vermin will work their way up through the floor. I consider that it might be improved by having the grain bins supported on strong legs about 18 inches high, so that either a cat or a small dog could get under them. The bottom of the bins should be made of planed boards, placed lengthwise from the back to the front, and about six inches higher in the back, with an opening in the front of each bin, closed by a shutter made to slide up and down; so that the grain might run out into a half bushel measure, placed under-

neath, when it is required to be bagged for market, or wanted for feeding purposes.

I can say a good word for broad wheels, as we used them on our farm in England. To the best of my recollection the tires were five or six inches wide, and the iron was put on, not in bent rims, but in streaks nailed on with large square-headed nails. This was also a saving whenever we had to travel on the turnpike road, as the toll was much less on broad than on narrow wheels. In casting out manure on ploughed land, for instance, for potatoes, the wheels would not sink so deep as the horses did. Such wheels might not last so long, as driving so many large nails tends to weaken the felloes. A four inch tire would be wide enough for this country, and if the hubs, felloes and spokes of the wheels were boiled in oil before they were put together, the wood would never shrink; so that the tires would last without resetting until they were worn out. This would cause an additional expense of two dollars for the four wheels of a wagon, but then the expense of resetting would be saved, besides avoiding the risk of the tire coming off on the road, and a probable breakdown. But it is difficult to persuade the generality of farmers that a little judicious expenditure at the beginning is the best economy in the end. A wagonmaker in my neighborhood tells me he could make better and stronger work than he does, but farmers will not pay the increased expense.

I have tried parsnips several times, and find them a surer crop than turnips, and better feed for cows, especially in the spring, as they may be left in the ground all the winter if necessary, and taken up in the spring improved in quality. Pigs are very fond of them, and if allowed access in the spring to the ground where they have been allowed to remain for the winter, they will eagerly root it up as deep as the roots of the parsnips may have penetrated. If the weather is favorable, I prefer to sow the seed in the fall; they will be up and in the rough leaf by the time seed can be sown in the spring, and so would have the start of the weeds. The difficulty here is to get the ground in proper order in the fall, on account of the frequent rains at that season of the year. I once prepared a piece of ground for carrots in the fall, and, after the manure was ploughed in, and the ground in good order, the next day down came the rain and continued so frequently that the ground was never dry enough to work with the seed drill that season.

The FARMER for January last year, page 7, contains an article on parsnip raising in the Channel Islands. I have been told by a native of Guernsey that they have ploughs there constructed on purpose for ploughing twenty inches deep, and as the farms there are generally small, the farmers assist each other with their teams in such ploughing. We can scarcely expect to get such heavy crops of parsnips here, with our dry, hot summers, as are raised in the Channel Islands. Still, wherever the soil is suitable, they are well worth raising, if only for the purpose of feeding the cows in the spring.

Perhaps "Subscriber" would have less trouble with his butter if he had a churn with a double bottom, so that either hot or cold water might be used to regulate the temperature of the cream, without mixing the water with the milk.

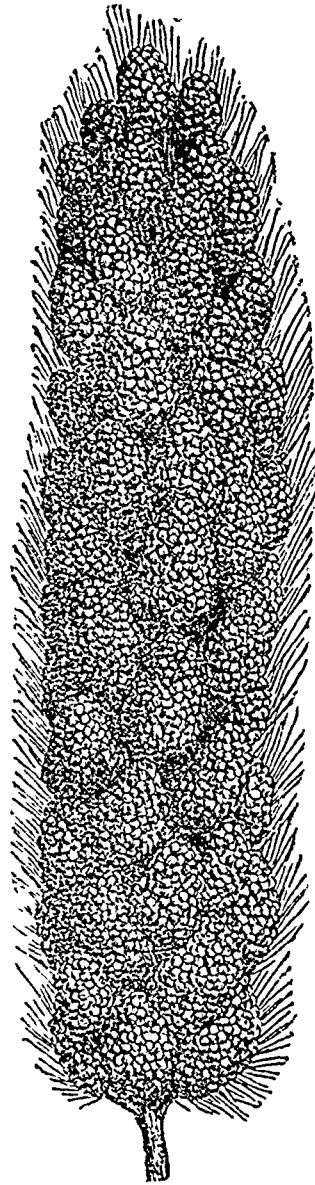
If a young farmer is such a fool as to marry a lady instead of looking out for a farmer's daughter, who from being brought up on a farm, knows how to manage a farmer's house, nothing better than running into debt, and having to mortgage, and then lose his farm, is to be expected, and serves him right; I say he has no one to blame but himself. As for Scotch farmers, however poor they may be when they, with their wives, emigrate to Canada, they are pretty sure to succeed, because their wives know how to save what their husbands earn—which they would hardly do if they were "ladies." Occasionally a lady, if brought up in the old country, may do well when she, with her husband, emigrates to Canada; but this is the exception, not the rule, and, in all countries and every station in life, some sensible women are to be found, and happy is the man who may have the luck to secure a sensible woman as a partner for life. This however requires a degree of judgment on the part of a man which is about as rare as good sense in a woman. But unfortunately, too many of our Canadian farmers care more for amassing and hoarding their wealth, than for improving their homes and giving their sons the liberal education

necessary to develop whatever natural abilities they may possess, so their sons frequently leave home and crowd into the cities, seeking employment for which, by their previous education and training, they are not at all fitted, so, if the son at last comes home and settles down on an encumbered farm with a fine lady-wife, failure is the inevitable result. But I must reserve some remarks on the education of farmers' boys and girls for another letter, as I am unwilling to encroach so much on your space at one time.

SARAWAK.

German Millet.

German Millet, sometimes called Bengal Grass (*Setaria Italica*), for an illustration of which we are indebted to Mr. J. A. Simmers, Toronto, belongs to the Setarian genus of annuals, imported from Europe, of which Hungarian grass is likewise a variety. It has a compound spike,



six to nine inches long, with small yellowish green or purplish spikelets one sixteenth of an inch in length, bristles two or three in a cluster. The flower is perfect, the stalk two to four feet long, and the leaves, resembling in many respects those of young corn, measure from six to eighteen inches. Specimens of the grass, entire, have been known to reach the prodigious height of nine feet. In Missouri, Kentucky, and several other States of the American Union, it is quite extensively raised, and, by its advocates, highly commended for cattle, horses, sheep, hogs, and even poultry. Its remarkable quality of resisting, or overcoming drought, renders it, generally speaking, a pretty sure crop. German Millet is partial to a dry, light or medium soil, but does not succeed so well on heavy, moist land. It may be sown from the 15th May to the 1st July, at the rate of about half a bushel per acre, if the intention is to save seed; or three pecks per acre for hay.

Too Much Seed to the Acre.

EDITOR CANADA FARMER: The above heading may seem somewhat strange, yet I doubt not that "too much seeding" is fraught with far greater injury to the productiveness of Canadian farms, than most people are aware of. A great many (shall I say a majority?) of farmers seem to act on the principle, not exactly that the more seed the larger crop, but that, if they only sow considerably more than a sufficiency, some at least of the superabundance will be sure to overcome the contingencies of unfavorable weather, &c., and yield them a fair average crop. The idea is erroneous. If we stock a field with twice as many cattle as its vegetation is capable of sustaining, what is the result? Why, of course speedy poverty, which will soon end in starvation, unless the animals are removed to a better pasturage. Why so? Because they must all be fed, and there is not sufficient on the field to feed them. Now the analogy between this state of affairs and an over-seeded field is complete. Plants, to arrive at perfect maturity, must have an adequate supply of their proper food, just the same as animals. In both cases life and growth have to be sustained. What then is the difference between overstocking a field with cattle that its herbage cannot support, and overwhelming the same field with a number of plants quite disproportionate to the capacity of its soil and the moisture it is capable of deriving from the atmosphere? None whatever. The results must prove alike either way—either stunted growth or utter starvation. In the case of thick sowing, how many of the plants, even after they do struggle above the surface, produce nothing, or next to nothing? Not only so, but they serve as a persistent impediment to the perfect maturity of stronger plants around them, whose heads grow to little more than half the length they would attain with plenty of room and nourishment. The grain too, in the best heads, is not so full and plump as it ought to be, and for the very natural reason that the stunted growth, in other words deformity, of the plant spreads itself through all its parts. I believe that the soil of Canada would produce a very much larger quantity and better quality of both grain and straw, if its cultivators would sow about one-half the quantity of seed per acre that they commonly do, and I would strongly urge the readers of the CANADA FARMER to try the experiment on at least a portion of their fields. Let them sow, say one bushel of oats, one bushel of barley, or one and a fourth bushels peas to the acre—about half the quantities usually allotted—and, no matter how thin the plants may appear for a time, I will guarantee that the returns will be more favorable in every way than if double the amounts of seed had been sown.

North Dumfries, Ont.

CANADIAN.

Culture of Mangel Wurzel.

The cultivation of root-crops is pretty generally understood by a large number of farmers, and yet as there is another large number who know little of their cultivation or their worth, I wish to make a few remarks on mangel wurzels. This truly excellent forage plant ought to be cultivated to a greater extent; and as a store for winter use it should be extensively adopted by the cottager who is the fortunate holder of an allotment and possesses a cow or a few pigs. It is one of the most profitable crops he can raise, yielding more bulk with real fattening qualities than perhaps any root we have. The beginning of May is perhaps the best time to sow the seed, for if sown earlier on light soil, it is liable to run to seed instead of forming large roots, and on heavy soil it is generally impossible to get the seed in properly till dried in the sun. Whoever attempts to grow mangel wurzel in the most profitable manner, or so as to obtain the greatest weight per acre, must previously get the ground in thoroughly good order and allow the plants plenty of room. It is an acknowledged fact that the majority of crops of this and similar roots are spoiled for want of thinning. On good land each plant will fully occupy a square yard, and when left closer than that, a decided loss upon the gross weight is incurred. There is plenty of proof that the roots may be grown to a much larger size than is usually done. I have read of some to weigh nearly three hundred pounds on several occasions, and that it is entirely dependent on the space allowed. Mangel wurzel may also be grown as a green crop to be eaten fresh in the autumn months, when in dry seasons grass is scanty, and is of much assistance especially to dairymen. Employed in this way the plants may be

left much closer, say twenty inches between the rows and a foot from plant to plant; the culture may be confined to one thinning of the plants and once or twice cultivating or hoeing to destroy weeds. The return will be an immense mass of food, which fed with hay, or some dry fodder, will be highly nutritious.

In storing this root, when raised to a large extent, the farmers in England make small ridges and cover them with straw, the same as they do with potatoes, and cover the straw with soil, making a ditch round the pile and beating smooth with the shovel or spade; the latter is merely to keep the former in its place. I presume in many parts of America the above plan could not be adopted, on account of the severe winters and frost penetrating so deep into the soil. A much better, and in fact the only true way of successfully preserving these and all other roots, is to keep them in a storehouse or cellar, and keep them perfectly dark and dry, removing a few of them at a time, as they are wanted. I am well aware there are many people prejudiced against roots, such as mangel wurzel and turnips, as being nutritious for cattle, and the generality of these skeptics are men that have not raised them to any extent, if ever, to know their practical worth. I would like to hear from anyone who has raised these roots and tell me what they know about them.

If the above remarks will be of any benefit to those who have not tried to raise this root as food for cattle, I hope they will do so, and report the result. For myself, I find them of great benefit, not only in fattening, but likewise feed to cows when dry. To feed a small mess when dry to cows, with oats or barley straw, will keep them in good order and prove an acceptable food to those who are scarce of hay. —*Cor. Germantown Telegraph.*

Profits of Oats.

The following statements were submitted by two different farmers, at a recent meeting of the Lenawee Junction (Michigan) club. They are interesting as showing the cost per bushel of production, and the profit accruing from its sale; and they are also useful as demonstrating the simplicity with which an exact record may be kept of any and every crop raised on the farm. It is only when the agriculturist adopts and follows such a system that he will be able to say really how his land pays. With farmer No. 1 the account stood thus:

Oat Field, 20 Acres.	
Dr.	
To five days with cultivator	\$ 15 00
" two days with roller	6 00
" two days drilling	6 00
" Seed—1½ bushels per acre	18 00
" Harvesting	40 00
" Drawing, threshing and loading	50 00
Total cost of crop	\$ 135 00
Cr.	
By 515 bushels of oats, at 36 cents	\$317 55
the straw he called worth	50 00
Total income	\$ 367 55
Deducting the total cost	135 00
Profit on the crop	\$ 232 55
Profit per acre	\$11 59
Cost of production per bushel	10½

Farmer No. 2 followed with his statement, which is as follows—the land under crops being two and a half acres:

Oat Field, 2½ Acres	
Dr.	
To three days ploughing	\$ 9 00
" half day sowing and harrowing	1 50
" 12 bushels seed at 37 cents	9 00
" harvesting	7 50
" drawing to the barn	4 00
" threshing, all told	13 00
Total cost	\$ 42 04
Cr.	
By 235 bushels oats at 40 cents	\$ 100 00
" straw	20 00
Total income	\$ 120 00
Deducting cost	42 04
Net profit	\$ 82 96

This made \$23.70 per acre. The next cost per bushel was only a fraction from 16½ cents.

Keeping Manure under Cover.

A learned professor, not long ago, in addressing one of our Canadian Farmers' Clubs, stated that the general treatment of manure, both in this country and the States, was simply disgraceful, and involved a loss of millions upon millions of dollars annually. He had seen it pitched here, there and everywhere, in the barnyard, in fence corners, on the roadside; uncovered and unprotected in any way; open to wind and rain, sunshine and storm from season to season; and yet there was no end of grumbling at the barren results that followed its application to the soil. Recently the same subject has been attracting considerable attention in Scotland, and although, as a rule, manure is well cared for there, the discussions prove interesting as showing how much more may be gained by

further carefulness. Lord Kinnaird, at one of the Farmers' Club meetings, gave his experience thus:

Four acres of good soil were measured, and two of them were manured with ordinary barn yard manure, and two with an equal quantity of manure from the covered shed. The whole was planted with potatoes. The products of each acre were as follows:

- Potatoes treated with barn yard manure :
 - One acre produced 272 bushels.
 - One acre produced 292 bushels.
- Potatoes manured from the covered sheds :
 - One acre produced 442 bushels.
 - One acre produced 471 bushels.

The next year the land was sown with wheat, when the crop was as follows:

- Wheat on land treated with barn yard manure .
 - One acre produced 48 bushels, 18 pounds (of 61 pounds per bushel.)
 - One acre produced 42 bushels, 38 pounds (of 61 pounds per bushel.)
- Wheat on land manured from covered sheds :
 - One acre produced 55 bushels, 5 pounds (of 61 pounds per bushel.)
 - One acre produced 53 bushels, 47 pounds (of 61 pounds per bushel.)

The straw also yielded one-third more upon the land fertilized with the manure from the covered sheds, than upon that to which the ordinary manure was applied.

There is no other treatment claimed in these experiments than that of simply keeping the manure under cover and our readers will agree with us that the gain is remarkable. Had Lord Kincaid saturated his covered heaps plentifully with plaster or some other such substance to seize upon and fix the escaping ammonia, he would have found the differences in results still greater.

To Mend a Broken Tug.

No one should go from home with a buggy or a waggon without a small coil of copper wire and a 'multum in parvo' pocket knife. This knife, as its name implies, has many things in a little space, and, amongst other useful things,



FIG. 1.—Repairing Tug.

has a contrivance for boring holes in leather straps. In case a strap or a leather trace breaks, while one is on a journey, and at a distance from any house, he would be in an awkward "fix" if without any means of repairing damages. With the copper wire and an implement for boring some holes, repairs can be made in a very few minutes. The ends of the broken strap or tug may be laid over each other or spliced; a few holes bored in the manner shown in fig. 1, and some stitches of wire passed through in the way known among the ladies as "back-stitching." The ends of the wire are twisted together, and the job will be finished almost as quickly as this may be read. If a buckle breaks, or the tongue of the buckle is drawn through, and made useless, the end of the strap may be turned back over the loop of the buckle, and the wire passed through the holes in the strap, as shown in fig. 2, and the ends fastened. If it is a chain that breaks, the next links may be brought together and wire wound around them in place of the broken link, which will make the chain serviceable until home is reached. In fact, the uses of a piece of wire are almost endless. Nothing holds a button upon one's working clothes so securely as a piece of wire, and once put on in this manner, there is never any call upon the women of the house at inconvenient times



FIG. 2.—Repairing Buckle.

for thread and needle to replace it. The wire will pierce the cloth without any help, and nothing more is needed than to pass it through each hole of the button and twist the ends to secure them, cutting them off close with the knife. There is scarcely any little thing that will be found of so great use about a farm, or a workshop, or in a mill, or even in a house, as a small stock of soft copper wire.

Professor Stockbridge's Experiments.

Professor Stockbridge, of Massachusetts, continues to publish his formulas and experiments with commercial fertilizers, awakening a degree of interest in the subject, hitherto unknown. It is a mistake, however, to claim his theory as original. More than a quarter of a century ago the idea of fertilizing chemically for a special crop, and for a definite quantity per acre of that crop, was promulgated

by a Parisian chemist, who had conducted his experiments successfully in ordinary flower pots. Prof. Stockbridge, therefore, is entitled to credit not for the theory itself, but for its elaboration, and more extended practical application. It would appear from his experiments, which are certainly interesting, that three, and only three ingredients are absolutely essential to the nourishment and growth of plants, all other necessary conditions being already supplied naturally in the soil and air.

In proof of this position test results are recounted wherein water was used as a medium instead of earth, and successful vegetation followed. These three ingredients are Nitrogen, which may usually be purchased in the form of Sulphate of Ammonia; Potash, as Muriate of Potash, and Phosphoric Acid, contained in the Superphosphate of Lime. Analytical tables are then given, showing the proportion of each of these ingredients contained in the various grains and vegetables, as for instance, in the fresh or air dry substances—per 1000 lbs. each of

	Nitrogen.	Potash.	Phosphoric acid.
Wheat grain	20.3	5.5	3.2
Rye grain	17.0	5.4	3.2
Buckwheat grain	14.4	2.3	4.8
Oats grain	19.2	4.2	6.5
Indian corn grain	16.2	3.3	6.5
Beans	49.3	12.0	11.6
Swedish turnips	2.5	59.4	11.3
English flax	1.2	38.4	12.5
Potato tubers	2.2	5.0	1.8
Red clover	21.3	20.0	6.0
Timothy hay	13.0	14.0	6.0
Corn stalks	4.8	18.6	7.6
Wheat straw	3.2	5.7	2.7
Rye	2.4	3.9	2.2
Buckwheat straw	1.0	24.0	6.0
Bean straw	11.3	31.5	5.0
Potato tops	2.0	2.3	1.0
Turnip tops	2.0	3.2	1.3
Tobacco	40.0	55.0	8.6

from which it will be seen that the fertilizers to be applied for any special crop must vary according to the analysis of that crop, and so on. Thus formulas are calculated and applied, as published in our last number. We subjoin a few of the published results from different parts of the States, merely observing before doing so that, from the table in our March number, any one can make out his own formula and test the matter for himself.

Mr. H. C. Comins, of Hadley, procured enough of the materials recommended to produce fifty bushels of corn, and applied them to a measured acre of fertile meadow land that had not been ploughed or manured for six years. The result was a yield of ninety-three bushels. A. C. Parsons, of Northfield, applied thirty dollars' worth of the complete fertilizer to an acre of poor sandy soil which had formerly borne nothing. Through the season he top-dressed it with forty bushels of unleached ashes per acre. The yield was one hundred and three bushels. H. L. Phelps, of Southampton, applied fertilizers for two tons of hay per acre, and harvested three and a half. E. H. Judd, of South Hadley, experimented for potatoes, and produced four hundred bushels per acre. By mistake he used the muriate instead of the sulphate of potash. H. Smith, of Springfield, fertilized a twenty acre cornfield for fifty bushels to the acre. Half the land was a stiff clay and quite rough; the other half good, ordinary soil. The result was an average of forty-five bushels per acre over all.

C. F. Fowler, of Westfield, used the potato fertilizer, aiming to produce 100 bushels above the natural yield. The soil was a coarse sand, with an open gravelly sub-soil. The crop started finely, made a good growth of tops early in the season, but at harvest time only about 40 bushels of tubers were harvested. The cause was probably due to the soluble condition of the fertilizing material, which in this sieve-like soil was rapidly leached through by the rain waters before the crops could benefit from them. If the fertilizer had been composted with loam, Mr. F. would have achieved more satisfactory results.

In these experiments the materials named have been usually employed as sources of the essential substances. But any neutral form will answer. The nitrogen may be obtained from any substance containing it in ready availability, though due importance should be attached to the fact that nitrates waste more readily than the salts of ammonia. The muriate of potash is the cheapest source of potash, but is unsuitable for tobacco, beans and root crops, injuring the burning qualities of the former, and the starch contents of the latter. In the experiment of E. H. Judd, he used the muriate, and though the yield was very large, the potatoes were quite inferior for table use.

The grades containing the percentages indicated may not always be easily obtained. But this is immaterial. The quantity of the chemicals to be used is based upon the percentage of nitrogen, potash or phosphoric acid they contain, and this being certainly known, the amount can be readily estimated by simple calculation. As a general rule, however, the higher grades are cheaper, on account of the saving in transportation and absence of injurious constituents.

The materials may be obtained from any responsible dealer in agricultural chemicals and fertilizers...

Drainage.

EDITOR CANADA FARMER:—As a subscriber to your valued magazine, I beg leave to enclose you a letter printed in the Colonial Farmer (Fredericton, N.B.) of date the 6th of December last...

The men, after amassing a considerable amount of money, and finding themselves without opponents, became exorbitant in their charges, but, discovering that we were not so verdant as they anticipated...

Perhaps by your kindly inserting this, interesting and experienced drainers may be induced to consider this province a favourable field for operations...

Saint John, N.B.

Yours truly, A. M. F.

The following is the letter:—

MR. FERRON.—The question has often been asked me,—"What is the cost of thorough under-draining land?"...

Last year, through the kindness of T. C. Scott, Esq., agricultural engineer and land drainer, of London, (Eng.) three first-class practical drainers were sent out to me from England...

Table with 3 columns: Description of work, Quantity, and Cost. Includes items like rods, feet deep, and extra work in open ditching.

Table with 3 columns: Description of labour, Quantity, and Cost. Includes items like Drain pipes, 1 1/2 inches, and various sizes of pipes.

899 98 per acre—Total cost 2184 79

The ground was hard, stiff clay, the wages earned by the men averaged 25 50 each man, per day...

There are but few farmers who could not do one or two acres per year, and not feel the work too laborious.

For thoroughly under-draining, stiff clay would at 2 1/2 feet apart, 1,100 rods, or 1,513 draining pipes, and all the ground be anything of an open bottom...

Table with 3 columns: Description of crops, Quantity, and Value. Includes turnips, carrots, and mangels.

Total on 4 acres 1,222 bushels

The remaining 3 acres was taken up by potatoes. From the same field in 1875, after thorough under-draining as before described, the following crop was taken:

Table with 3 columns: Description of crops, Quantity, and Value. Includes turnips, carrots, potatoes, parsnips, and mangels.

The balance was in grass. The field was equally as well manured in 1861 as in 1875, but more labour hoeing and weeding, the former year, on account of the land being wet.

I do not regard the crop of the latter year as being any way unusual. No doubt many have larger crops. My object is simply to show the difference in the yield of the drained over the un-drained land.

It is true the expense of under-draining the land was large, costing nearly one hundred dollars per acre, the formation of the ground, however, was such that the cuttings were more than ordinary deep, averaging 4 feet 6 inches deep...

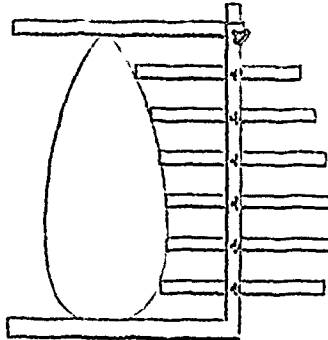
I think our farmers could do the work, after a little practice, as well, and much cheaper; but even at the price it has cost me, I consider it has paid good interest for the 6 1/2 years.

I have tried to be as explicit as possible, leaving to your readers to draw their own conclusions. There is one thing, however, I must add, viz. Never attempt to cultivate wet land with a drain pipe. If draining will not pay, working will not succeed.

Minawabush, St. John County

Horse Collars.

The use of a badly fitting collar is a piece of downright cruelty to the working horse. The continuous strain on the neck and shoulders, whether in the plough, the wagon or the carriage, concentrates upon two or three spots instead of being diffused uniformly over all...



This may be fastened in their places by set screws. In measuring the horse, the frame is placed on the neck, when the collar should rest, and the upper sliding arm is made to touch the top of the neck...

MANURES FOR ROOT CROPS.—Theories and experiments are all good as far as they go, but a few facts outweigh them all. On good loamy soils, well worked, and finely pulverised, 10 cwt of superphosphate is by no means an over-dose.

The Value of Gypsum.

The slow progress that has been made in this country in the use of gypsum is a little remarkable. It was first introduced by Dr. Franklin from France, previous to the revolutionary war. On a clover field in the neighborhood of Philadelphia he sowed some pulverized gypsum or land plaster in the form of letters...

In other parts of the country similarly situated it is used very sparingly or not at all. As a rule farmers are not fond of trying experiments that cost money. They prefer to wait and let someone else make the trial of the value of a fertilizer...

Gypsum is not a fertilizer that is of great value in all portions of the country, on all soils in a given section, or for all the crops that may be grown on a given soil. Regions that are well supplied with lime and sulphur in any form are seldom benefited by the application of gypsum.

Dry soils receive the most benefit from the use of this substance, and the drier the season the greater the amount of good from its application. The crop that receives the most benefit from the use of gypsum is our common red clover.

WHEN TO PLOUGH UNDER RYE.—The more tender the plant is, and the richer it is in nitrogen, the more rapidly it will decay when ploughed in; in both these respects there is a pretty steady diminution from the earliest stages of growth onward to the end of the season.

MANURES FOR GRASSES.—Experiments in top dressing for grasses, conducted during several seasons back at the Michigan Agricultural College, may be summarized as follows.—The plots—half an acre each—of sandy, warm soil, exhibited the following facts at the end of three years: The top-dressing was applied in 1864, and the grass was cut twice each season in 1863 and 1866.

Horticulture.

More about Parsnips.

EDITOR CANADA FARMER:—I notice an article in your paper for February from "Publicola," entitled "What I know about Parsnips," and, as the parsnip is a favorite root with me, it being, as I think, second to none grown, especially as food for stock, hogs, &c., anything I see in regard to its culture or use, always interests me. But either "Publicola" or the printer has made such a glaring mistake, that I think it should not be passed over, as it is likely to lead farmers and others a long way astray. "Publicola's" system of preparing his land is all right, but his figuring is what is so very defective. I have the article referred to before me, and it reads "perhaps the most economical distance for rows is twenty inches, and the plants 24 inches apart in the row, which will produce in round numbers, 50,000 roots to the acre, and allowing 1 pound per root, the yield will be 25 tons. Now, sir, I understand the term 'round numbers,' to mean the nearest even number, without taking into account (as in this case) the odd hundreds or parts of a hundred. But "Publicola's" few odd numbers amount to about 37,000, as I will show. An acre contains 43,560 square feet, and plants set 20 inches from row to row, and 24 inches in the row, would each occupy a space of $3\frac{1}{4}$ square feet, and would give us to the acre, in round numbers, 13,000, or to be exact 13,068 plants—no small difference between that and 50,000, as stated by "Publicola."

In regard to subsoiling, it matters little how it is done, so long as it is done; and in this "Publicola" is a little out; he recommends driving the team tandem. Last fall I prepared about $\frac{1}{4}$ of an acre for parsnips, exactly as recommended, (half of which I sowed on 3d January, the remainder I will sow in spring, and note the result) excepting the subsoiling, which was done with the team driven the same as with the plough, working from the centre to the outsides, the subsoil-plough adjusted to follow the right hand or off horse; consequently no foot marks were left. It takes some time, and no small amount of ingenuity to change a team from a span to tandem, with the same harness, as "Publicola" will find if he tries it; whereas, I simply change the team from one implement to the other without any delay. I also think the weight of the roots might be rated higher, it does not require a large parsnip to weigh a pound. If cultivated as recommended by "Publicola" they ought to average nearer three pounds than one.

RUSKIC.

The numerical error pointed out here by "Rusik" results from an oversight in the manuscript, "24 inches apart" should read "4 to 6 inches apart."

EDITOR CANADA FARMER.

New Blackberries and Raspberries.

EDITOR CANADA FARMER:—I wish to say a few words about a new blackberry and raspberry that have been produced in this quarter of the country, and that are not known, I believe, east of this. From my experience of them I feel sure they are well suited, and would prove profitable for Canadian fruit growers. The blackberry is called the "Western Triumph." Several years' experience here has proved it to be perfectly hardy, a great bearer, and of first-rate quality—in fact the only blackberry I know of that can be shipped when quite ripe. Last winter, when all other kinds were killed out—the thermometer ranging between 20° and 30° below zero, and no snow on the ground—not a bud of the "Triumph" could be found injured. It is of a dwarf stocky growth, can be planted as closely as raspberries, and does well on either heavy or light soils.

The "Turner Seedling" raspberry, after several years' cultivation for market, has been pronounced by fruit growers their most profitable red raspberry. It grows rank, and produces well on the poorest sandy soils we have, is hardier than the "Philadelphia" and of finer quality of fruit than the "Clark." We raise another raspberry that is found to be very profitable on account of its ripening some eight or ten days earlier than any of the others, viz., the "Kirtland." It requires good soil to give it sufficient growth, but bears large crops of bright

scarlet fruit that stands shipment better than any other raspberry we raise. If your readers care about hearing from this land of fruit raisers, I may perhaps send you some more of the experience of a Michigan

FRUIT GROWER.

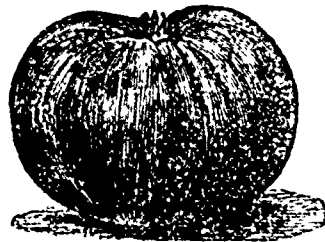
Benton Harbor, Mich., W. S.

We shall be happy to hear from "Fruit Grower" again.

EDITOR CANADA FARMER.

The Tomato.

There is a certain deterioration in some kinds of this wholesome fruit, and it is well, in selecting seed or plants, to be sure what we are purchasing. As a general rule no one will be far astray in choosing the Grant, the Deliance,



the Excelsior, or, perhaps best of all the Trophy, which we illustrate from the catalogue of Mr. W. Rennie. With proper treatment and culture, it will be found as early in maturity, and possessing as many good qualities in every way as the finest of all other species. Assuming that the seed has been sown in hot-beds at the proper time, let the plants, when transplanted, be set from four to eight inches apart. Never let the beds get too thoroughly soaked with rain, or the roots will strike down into the manure and the growth upwards will be too tender. Some people are disposed to ridge up at the last, especially where vines are not staked, to give support to the plant, and elevate the fruit when the vines fall over. It is indeed a question whether or no level culture is best.

The Artichoke.

The Artichoke is not much grown in America, and yet the occasional application we have for seed shows that it is not unappreciated in some sections of our country. In Europe we found it served almost everywhere, and in almost all conditions. The portion used is the flower-head in an undeveloped state, as shown in the engraving; in fact, the scales of the involucre. They are boiled and then served somewhat as Asparagus, and the lower portion of the scales only are eatable, and have somewhat of an asparagus taste. They are also used raw, as a *salad*,



but really we do not consider them much of a luxury. The Artichoke is grown from seed, and suckers from the root will readily form new plants. It is a perennial plant, but needs some protection in the North. The plants may be covered in the winter with coarse manure and leaves.—*Vick's Floral Guide.*

What I Know about Parsnips.

Concluded from last Month.

Lifting and Storing.

When the leaves are turned yellow is the time to lift them. I have never, as yet, seen any account of this process besides the digging, which is unsatisfactory, as being slow and laborious. Our system is as follows. Take the breadth, say of thirty rows, and with the strongest pair of horses, begin on the right hand side by ploughing a furrow as deep as possible, and quite close to the roots; and back by the side of the thirtieth row on the left. This first furrow is not so perfectly done as will be the after rows. Observe now, the roots are standing on the side of a precipice; but

by reason of their crowns being slightly imbedded in the soil, they cannot be handled. Now, to follow the plough, it requires a gang of four men, and the more the better on a large scale. Two men now follow the plough with spades which are seven or eight inches wide, and stab them behind the parsnips taking two at once, and slightly pushing them over the furrow; when the other two, following in the furrow, can quickly take hold of them and jerk them out, and throw them to the right in a row. This done, the plough follows again with the next slice, ten inches wide, and ten inches deep, which will be just half the breadth of the rows. The next ten inch slice brings the plough again close to the next row, and the same process continues till the thirty rows are lifted. I will suppose these thirty rows contain half an acre, and that is as much as may be needed for winter use. Then, before any more is lifted, pick up these and cart them to a shed or barn, where they can be trimmed in bad weather. I will suppose there yet remains half an acre more that will be wanted for the spring, which may consist of other thirty rows. These are to be ploughed up the same as the others, which will leave a large open furrow in the middle, as before, and this furrow should be made extra wide and deep, by going an extra bout. Into this furrow the thirty rows are to be thrown without any arrangement or trimming. Then take one horse and plough, and go first to the left, and back on the right, and throw a good slice of earth on, so as to cover the roots; and, if not completely done, finish with the shovel. There they must lay till spring, and not be touched till the frost is quite out of the ground; and, when wanted, the earth is to be shovelled off, and the roots lifted up with a dung fork; then carted off to some shed or barn to be trimmed at pleasure. But, in cutting off the leaves on this occasion, the crown must be cut deep enough to prevent sprouting, and the roots will keep till midsummer.

As aforesaid, one pound weight to a root, is not too high an estimate, and 50,000 to an acre can be grown without crowding, which in tons would amount to 25; but, to allow for all possible drawbacks, deduct two-fifths, and 15 tons per acre remain. This quantity, estimated at the low price of \$5 per ton, will amount to \$75 per acre, from which deduct for all expenses as follows:—

Ploughing once in the fall.....	\$ 2.50
Harrowing.....	.50
Sub-soiling and Ridging—equal to two ploughings.....	5.00
Four Hand Hoings.....	6.00
Three Horse.....	2.00
Manure.....	15.00
Harvesting.....	15.00
Rent.....	6.00
Seed.....	.75

Total Expenditure..... 60.75
Receipts, 15 tons at \$5..... 75.00

Profit..... 24.25

Crops Following Parsnips.

After removing the parsnips in the spring from their resting place during winter, and just as soon as the ground is dry on the surface, the cultivator must be used cross-wise or diagonally, which will sufficiently level the surface by once going over. When this is done, let no footsteps be seen on the surface. After lying in this condition a few days, barley should be sown, and I venture to add that 15 bushels more per acre will be yielded than on ordinary prepared ground; and this addition must be added to the parsnip crop.

The cultivation of the parsnip is not here intended to supplant, but to supplement the farmer's limited resources for feeding and fattening his stock in winter. At present his principal (one) root is turnips, but few grow carrots, and a less number, Wurzel, and it is not extravagant to say on the part of the parsnip, that one ton is worth two of the other named roots. They are easily cultivated, and have no drawbacks in winter keeping.

PUBLICOLA.

PECULIARITIES OF GERMINATION.—The instance quoted by Mr. Webster, says the *Gardeners' Chronicle*, of a plum seed vegetating after having been boiled in the jam, is not the only one of the kind on record. Dr. Lindley has mentioned a case of raspberry seeds vegetating after being subjected to the same ordeal, and he also states that the practice of boiling the seeds, of leguminous plants especially, with the object of making them germinate more readily, had been adopted by several persons with perfect success (Theory of Horticulture). The fact does not appear so wonderful when we know that seeds will stand without injury a temperature as far below the germinating point as above it.

The Highland Hardy Raspberry.

The plant is of vigorous growth, from four to five feet in height, affording abundance of wood to support the fruit. The canes are perfectly hardy, and have withstood a temperature of 16 and 20 degrees below zero the past winters without apparent injury. I give no protection whatever, nor do they require it, as the canes bear fruit in abundance to their very tops. Their being entirely hardy is the chief cause of their supplanting so largely the Antwerp and other kinds requiring winter protection. The time is not far distant when they will supplant the well-known Hudson River Antwerp almost entirely in the river counties which supply so largely the markets of New York city. They seem adapted to all kinds of soil, and is usually grown upon, except clay. As an experiment, I have planted them on a diversity of soils, and find that they can be grown with profit even upon a heavy clay soil, if well drained, either naturally or artificially; though they do best on a gravelly soil or light loam. The berry is a bright red, unusually firm, which makes it of great value for shipping to different markets; flavor very good; size medium to large, surpassed in this respect by the Herstine, Brandywine or the Antwerps. The fruit ripens considerably earlier than most red varieties, coming into market or upon the table a little before the Kentucky, Jucunda or Col. Cheney strawberries commence to disappear. Their earliness causes them usually to bring a good price. The Highland Hardy is unusually productive, giving with ordinary culture from forty to fifty bushels per acre; the crop selling in New York from \$400 to \$600 per acre. Under very favorable circumstances the fruit from small plots has sold at the rate of \$1,500 to \$2,000 per acre. The latter figures are rare exceptions, but still they show what success has been reached. Plantations may be made in the fall or spring, and usually the young shoots are planted with success as late as the 10th of June. The ground should first be well ploughed—and given a good coat of barn-yard manure. After harrowing, the ground can be marked out with a plough or otherwise—placing the plants four feet apart each way, or by making the rows six feet apart and the plants two and one-half to three feet distant in the rows. The first method permits of better culture, though the yield does not differ materially either way. The ground should be kept well cultivated, except when the fruit is ripening. Manure the plants well late in the fall or in the spring of each year; but not too liberally if the soil is naturally very rich. The second season from planting usually will give a paying crop, though full returns should not be expected until another year. The Highland Hardy has been widely disseminated throughout the land and correspondents report success nearly equal to that obtained upon their native soil.—*Can. Live Stock Journal*

Planting Cherry Trees.

A correspondent of the *Rural Press* gives his experience thus: He says: I go to the nursery early in the fall, the first of November, and select the best trees I can find. If I can irrigate, I take two year-olds, if I cannot water but little, if any at all, I take one year old trees, strong, healthy growers, and pay the price for them. I charge the men that are digging the trees not to rub off any buds near the ground, as I want all these for shade to protect the trunk of the tree from the hot, burning sun. This is one of the four great principles in promoting longevity in the tree and success in the business.

Planting

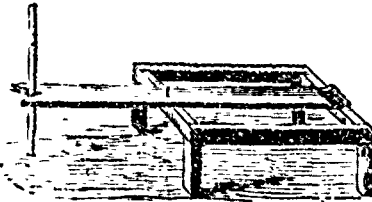
My ground is well prepared, graded and levelled for irrigation if it is needed, and staked off the proper distance apart (say 20 to 25 feet each way). In order to save time in sighting to get the trees in a row both ways, I use what we call a "tree setter." It is made as shown in the cut.

It is 12 inches by two feet, the legs are 10 inches long. One by two inch lumber will do, well nailed so it will be firm and steady.

Now take your tree setter and place the fork of the sweep to the stake, press the legs gently and evenly in the ground, being careful to have the stake perpendicular, because if it leans one way or the other, the tree will be that much out of the row. Turn back the sweep. Now dig the hole two and one-half feet in diameter, and two feet deep. Throw in six inches of fine top soil, leaving the bottom somewhat crowning. I have all my trees taken up with long roots, so you see that it requires a good sized hole, that the roots may remain in their natural position and not be cramped.

In using the tree setter we dig one hole at a time and plant the tree before we dig another. But before planting we come to another very important item, and that is root-pruning. No tree should be planted until every root that is torn by the spade should be carefully dressed. I take up the tree in my left hand, close to the roots, the top pointing to my back. With a sharp knife in my right

hand I prune every root on the tree that has been torn or mangled up with the spade, cutting the bevel on the under side. This gives the roots a chance to pursue their downward course. When the little rootlets begin to start out, they look something like the toes on an elephant's foot, and the cut will heal over in a very short time. The tree is ready to be placed in the hole, where it is to remain as long as you live, who knows? Now turn back the sweep, place the tree where the stake was before the hole was dug, being careful to keep the tree plumb, as before directed in regard to the stake. Let your helper hold the tree in its place. Get down with your right knee on the rim of the hole, your left foot in the bottom of the hole, so you can work easily and comfortably. Carefully straighten out all the small fibrous roots, all the while tamping the



A Non-Patented Barrel Header.

Not long since we saw in operation a useful contrivance for pressing the heads of apple or egg barrels into place. Both apples and eggs require to be packed very firmly to enable them to be transported in barrels with safety. Apples loosely packed in a barrel will come to market in a very badly bruised condition, and if the packing around eggs is not very firmly compressed, the eggs and packing change places or get mixed up, and it is the eggs, and not the packing, which then suffers. A barrel of eggs properly packed, with layers of chaff or oats an inch thick between the layers of eggs, and three inches at each end of the barrel, will bear to be compressed as much as three inches with safety, without this compression eggs are almost sure to be greatly damaged. A barrel of apples may fill the barrel to about two inches above the chime, and will bear to have the head brought down to its place. When barrels containing these perishable articles are thus packed they may receive very rough usage without injury to the contents. The header referred to consists of a bar of half inch square iron rod with a large eye or loop at one end and at the other end two diverging hooks which grasp the bottom of the barrel. The bar is bent to fit the curve of the barrel. When in use, the hooks are placed beneath the lower chime of the barrel, one end of a short lever is placed in the eye, and the lever rests upon a block, which is set upon the head of a barrel properly placed in position. A strap or cord, with a loop or stirrup at one



end, is fastened to the other end of the lever. The foot is placed in the loop or stirrup, and the weight of the body thrown upon it brings the head of the barrel into its place, the hands being free, the hoops can be driven down tightly without the help of an assistant. Without the use of the cord and stirrup, two persons are required to head barrels, but with the aid of these the services of one can be dispensed with.

Cultivation of the Cherry.

At the last meeting of the Maine Pomological Society Mr. Fernald, of Harrison, remarked as follows upon this subject.

There is but one universal maxim for the cherry tree and that is, "a dry soil for the cherry." It will thrive in

a variety of soils, but a good sandy or gravelly loam is its favorite place.

It will grow in much thinner and dryer soils than most other fruit trees, but to obtain the finest fruit, a deep and mellow soil of good quality is desirable. If forced to grow in wet places, it soon decays and is very short-lived. Cole remarks: "A soil where Indian corn is not liable to suffer from drought or wet is best for the cherry." I consider location, having proper regard to the quality of the soil as to richness, the most important consideration in planting the cherry. An instructive example in the speaker's experience was given, showing the striking difference in thriftiness and growth of trees only a few yards apart as affected by varying degrees of moisture or fertility. Remarks on the propagation of trees in the nursery, with interesting quotations from eminent sources were also given, which want of space compels us to omit. Grafting is said to be a difficult operation, and should be done in early spring if at all, before the slightest swelling of the buds, and before the frost disappears from the ground. Mr. Thomas admits that in propagating the slower growing or sour fruited varieties, good trees are often soonest obtained by grafting or budding them at standard height on large, straight stocks. Experiments in trying to propagate the Hearts and Bigarreaus on the common Kentish stocks, have generally failed. But the May Duke and Morello will succeed well on the common "tamo" or Kentish stock. Mr. Fernald had succeeded in grafting the May Duke on small stock of that variety after the first of June.

The cherry requires but little cultivation further than supplying old trees with a little dressing occasionally, to keep up their vigor, pruning out a dead or crossing branches, and washing the stem with soft soap, should it become hard and bark-bound. Ploughing or any deep cultivation near cherry trees should be avoided. A. M. Purdy of the *Fruit Recorder* says: "In growing cherry trees in a light, loose soil, the less the ground is stirred the better." *The London Journal of Horticulture* says: "Fruit trees like solid soil, not loose," and advises "keeping fruit tree borders solid and mulched with manure." "Pruning," says one writer, "the cherry very little needs, and as it causes the gum to flow and brings on decay, it should be avoided except when really required."

The disease known as black knot was fully discussed, and the various theories of its causes considered. One writer says potash in the soil is a preventive of the black knot. Another distinguished writer and investigator pronounces black knot a fungus caused by the working of the microscopic insects or larvæ which poison the sap, and asserts that the black knot is "a sequence and not a cause of disease."

Of varieties to plant, the Early Richmond, Early Purple Guigre, May Duke, Black Heart, and several others were described and recommended for cultivation. Several instances of the remarkable productiveness of the Black Heart cherry in Maine were cited. The cultivation of the cherry has, of late years, become a success in Massachusetts, and commands a high price in Boston and other markets. Some regard cherries an unsafe fruit for shipping purposes, but it is believed to be as safe to transport them by rail or steamer as most other kinds of soft, perishable fruits. Besides there is a good local market in every village in Maine for many bushels of this fruit at remunerative prices. A cherry grower would only have to show his fruit, for it to be purchased at sight with cash at hand. This branch of the subject was presented in a favorable light, and cherry culture described as a profitable business.

SMALL POTATOES FOR SEED.—A correspondent to the *American Farm Journal* says.—I find it the custom among my neighbors to keep out small potatoes for seed. They say a small potato will produce a better crop than a large one. One man said experience convinced him that a potato which was not full grown was a better one for seed. One year he had a very large field to plant and supposed he had ordinary seed enough to go around. But his men came to him before they had reached the farther side, saying they were out of seed. The only potatoes he had was a pit of small ones he was feeding to his stock. He sent them to it for seed, but not expecting they would yield much, if any. When he dug his crop he found the best potatoes where these small ones were planted.

ASPARAGUS.—At a meeting of the Farmers' club of the American Institute N. Y., Messrs. Bruen and Curtis gave the following suggestions relative to the culture of this highly relished vegetable. The roots should be put four inches deep and sixteen inches apart; the ground must be well manured and forked over. Salt should be liberally used, a bushel and a peck might be put on a bed 18 by 36 feet. He never cut after 1st of June. In cutting it was important not to go too deep. An asparagus bed would last an almost unlimited length of time if taken care of. Also, in spading asparagus beds it was important not to injure the crown of the root, which came near to the surface. Continual cutting will, in time, kill asparagus, like any other vegetable. Young asparagus beds should not be cut much for two or three years. A foot of horse manure should every season be put on the beds. Every farmer should have an asparagus bed. It was a most healthful food. The expense of planting a bed was very small. No spading and forking were necessary; nor was salt essential, though it was good.

Live Stock.

Chester White Pigs.

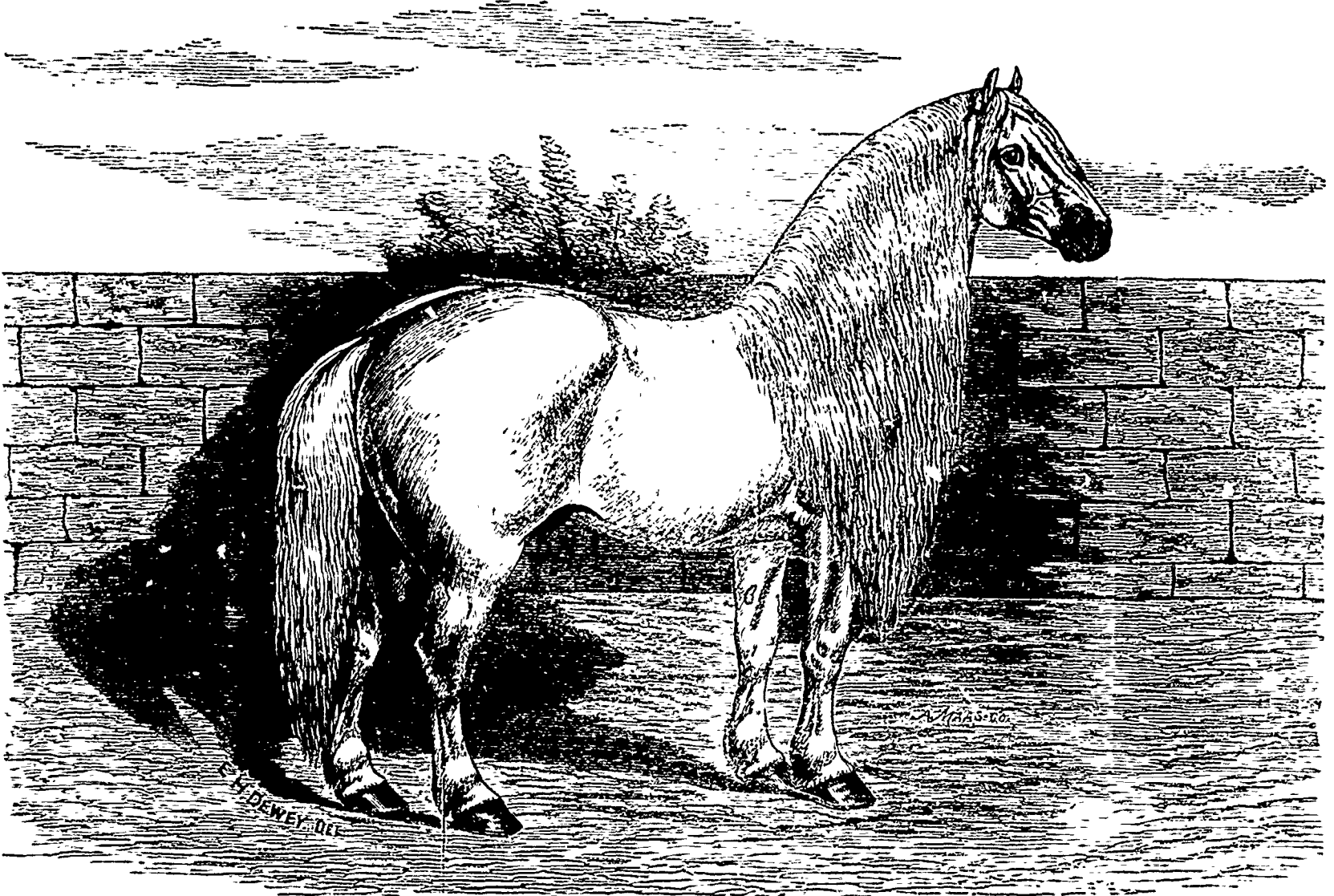
EDITOR CANADA FARMER:—The Chester County Whites, concerning which a correspondent of the CANADA FARMER enquires, are a "made up" breed, being a cross between some of the best "natives" of Chester County, Pennsylvania, and a Bedfordshire boar imported from the old country by Capt. Jeffries, half a century ago. That the Chesters are a mixed breed is proved by the great variety in their appearance and feeding qualities. The doctrine of——— or ancestral influence, is peculiarly illustrated by very fine sows bearing often indifferent pigs and many litters, from perfectly white sire and dam, being diversified in color, arising from some early crossing with the Berkshire.

If man is fearfully and wonderfully made, so is the hog. If one needs fresh air, exercise, dry and clean sleeping places, and proper food, so does the other. If one will get full of vermin and disease by close penning with his kind, generate cholera, dysentery and fever from improper diet, so will the other. As in the treatment of our horses and stock generally, we have only to see how we can stand the abuses we subject them to, to discern the reason of their diseases. Therefore, give pigs a clean, dry room as well as a litter yard if you must pen them up. Keep them growing by regular and proper feeding, with grass, charcoal, and ashes occasionally. Wash out their troughs often, and change their bedding at the same time. In other words, let every person treat his hogs as he would like to be treated himself, if he had got unluckily into the hands of a Polyphemus who was fattening him for future consumption, and he won't be troubled with the ailments among them which are now threatening to make "western pork" a bye-word for disease, and perchance epidemics, fatal to the eater's constitution.

Lewis, Mass., U. S.

R. GOODMAN.

am not a stock-raiser, but think I can give some information on the subject. Mr. Bryght says he has a very fine bull, and complains that he can get no progeny from him. I would here suggest that the fault is not in the bull, but in his owner, in allowing him to go to the female at an improper time. But little was known on this important subject till within the past few years, when a law was discovered by a French veterinary surgeon, Prof. Thury, of the Academy of Geneva, by which, in the case of animals especially, either sex can be produced at will, with almost absolute certainty. He studied the sex of the offspring with reference to the date of conception, and discovered the following almost invariable law: When the male is given at the first signs of heat in the female the result is a female; but when the male is given toward the end of the heat the result is male offspring. The reason of this law has not been definitely or satisfactorily explained, but that it is correct has been proved by numerous experiments on various kinds of animals, and especially in the case of



The Norman Percheron Horse, "SUCCESS," the Property of M. W. DUNHAM, II.

The Norman Percheron Horse, "Success."

Yet, with all the irregularity to be expected when pure breeding cannot be depended upon, so full a development of nearly perfect figure, quiet habits, and fattening tendencies, exists in the best examples of this breed, that we are warranted in claiming for it superior excellence. For family use, a cross of the Suffolk with the Chester produces a compact, well-shaped, small-boned, early fattening pig, difficult to beat. But it is easier to get good pigs than to keep them well, and the pork raisers in the central portion of the States are reaping a harvest of "Trichinosis" and "Hog Cholera" from the beastly manner in which swine have been, and are, kept, closely huddled together in filthy pens, and fed on the offal of slaughter yards, much of it of diseased Texan cattle.

Few people seem to know or remember that the hog is naturally a cleanly animal, with roaming habits, its natural food the grasses, acorns and roots, and that, if allowed, he will bathe daily—more than can be said of his devourer, whose internal structure very closely resembles that of the hog and bear.

Our illustration on this page represents "Success," a Norman Percheron horse from the stud of M. W. Dunham of Illinois. The breed is becoming quite popular with the agriculturists across the line, and in Quebec many fine specimens of it are to be seen. For heavy draught, combined with bottom and speed, these animals are said to be almost unsurpassed.

Sex Production.

The following interesting communication recently appeared in the *Courier Journal* from the pen of John Way of Raleigh, North Carolina. He says: I notice in your issue of the 9th inst. a very intelligent letter from Casper Bryght on "Tobacco fertilizers, stock-breeding," &c., in which he requests all stock-raisers who know anything about the laws that govern the production of sex in the embryo of animals, to send them to you for publication. I

cattle. In a certified report to the Agricultural Society of Canton de Vaud, Switzerland, made in 1867, the writer, after carefully testing Prof. Thury's law, says that on twenty-two successive occasions he desired heifers,

He followed Prof. Thury's law and did not fail in a single case. On seven other occasions he desired males. Again, following Prof. Thury's law, he had not a single failure. But few experiments of this kind have come under my own observation, but in every instance in which I have had an opportunity of observing, the correctness of the above law has been fully proven. I hope Mr. Bryght may be induced to try it and have no doubt that he will succeed to his entire satisfaction. If he desires fuller information on the subject he can obtain it from a work entitled "The Transmission of Life," by Dr. Geo. H. Napheys, commencing on page 195. It is published by J. B. Fergus & Co., of Philadelphia.

When pigs are observed restless in their pen, fretting while they should be sleeping, close it out.

Rearing Twin Lambs.

Every ewe should rear at least one lamb per annum, which ewes would do, if they were fed, watered and protected properly from storms and cold weather. If sheep were fed with more intelligence and skill, almost every ewe would produce two lambs at a yearling, both of which would be reared. Fifty years ago, when almost every farm kept a few sheep, it was unusual to see a breeding ewe with only one lamb. We have in mind small flocks of ewes every one of which reared twins every season. The kind of sheep reared at that time consisted of large, coarse-wooled animals, resembling the Cotswolds more than any other breed, although they were denominated "natives." They were more profitable for producing lambs and mutton-sheep than they were for wool. The ewes were excellent nurses. A lamb was seldom lost, except when it was dropped during some cold and stormy night in the open yard. If farmers failed to raise two lambs per ewe, they felt that they "did not have good luck." The standard of "good luck" was represented by two lambs per ewe. But at the present time, most proprietors of flocks think that their "luck" or success is abundantly satisfactory if the ewes rear seventy to eighty lambs per one hundred yearling. It was stated in the *Agricultural Gazette*, (Eng.) by a farmer who had visited some farmers in Hampshire, that the proprietors of sheep considered that if they succeeded in rearing one lamb per ewe "they had excellent luck," whereas farmers in Suffolk were not satisfied when they reared two lambs per ewe. There is no such thing as "luck" in the breeding and management of sheep. Success will depend on intelligence and skill in selecting breeders of the most desirable characteristics, and in taking timely care of the ewes during the period of gestation and particularly at the yearling season. If ewes received proper care—paying care—a lamb would not be lost oftener than a calf. Ewes are more prolific than cows; and certain breeds are more prolific than others. When one lamb per ewe is not reared per annum, the proprietor may rest assured that his system of management needs to be improved.—*Practical Farmer.*

Non-Breeding of Cows.

Nymphomania, or an absence of the fecundating principle in cows, is a disease, if indeed it may be properly termed, of comparatively rare occurrence. Sometimes however it does occur and is the source of considerable disappointment to the farmer, especially if the animal has come of a fine stock of breeders and milkers. Various remedies, amongst others the use of coarse grass and fodder alone for food, have been tried for this ailment with variable success. In some cases these latter effected the desired cure, probably by relaxing certain systemic organs which had become compacted or consolidated through the use of too much rich food. In others, however, they had an opposite effect, the cow only laying on more fat. A system of bleeding was then adopted with a view probably to relaxation by exhaustion. On this course a writer in the *Country Gentleman* narrating his experience with a fine Jersey cow which had been regularly and adequately served, but with no results, says: I had just made up my mind to consign this fine animal to the butcher, when I observed an article in which it was stated that under similar circumstances copious bleeding was resorted to with great success. I determined to try the remedy, although the chronic character of the disease did not encourage success. A large quantity of blood—the exact amount I have forgotten—was taken from the cow.

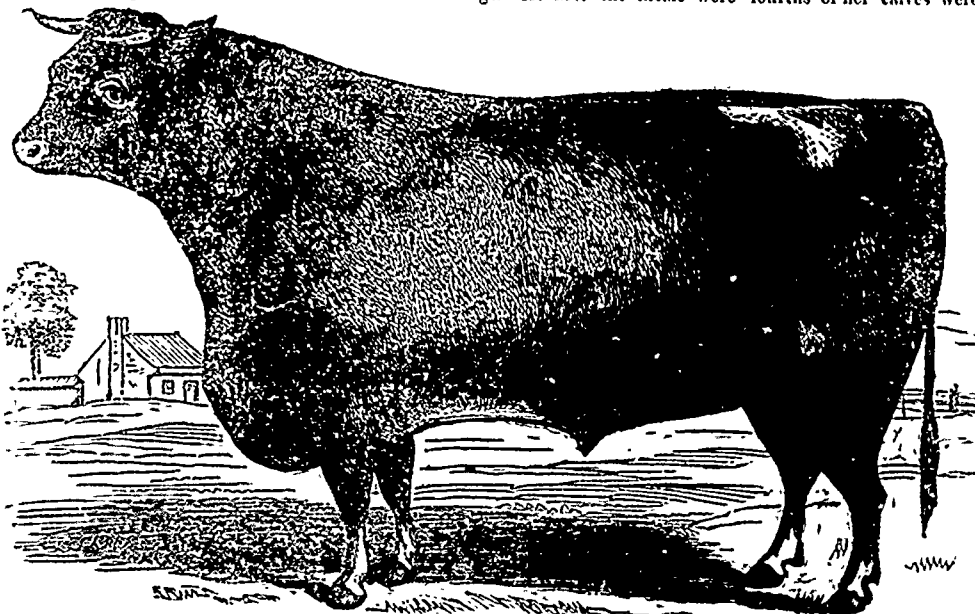
The bleeding weakened her so that she fell to the ground in an almost fainting state. The recovery of her strength, however, was rapid. Shortly afterward the cow was served, and within six months she was delivered of a still-born calf. In less than a year afterward the cow dropped a bull calf, and at once became the finest milker in my herd. Since then she has come in regularly every year, and has given me two fine heifers, which promise to be in every way worthy of their mother. After the dropping of her first calf upon the resumption of her vocation, the cow's milk was accurately measured, and the butter weighed. Seven quarts of milk yielded a pound of butter, of which, for at least two months, the average production was 105 pounds per week.

Experiments in Pig-Feeding.

An imitative series of experiments in pig-feeding conducted at the Ontario School of Agriculture during the past session, affords some interesting results. Half a dozen young porkers, of about equal weight and dimensions, were paired, and each pair separately penned. The housing was somewhat indifferent but every attention was given to bedding, cleanliness, regularity in feeding, and accurate measurement of the food allotted. The feeding took place thrice daily, those in pen 1 receiving raw pease and water; in pen 2, boiled pease, and in pen 3, house refuse and wheat middlings. At first the meals were

Short-horns for Butter.

In answer to a correspondent desiring information as to the comparative merits of short horns for dairy purposes, Mr. C. Moore of Pennsylvania says in the *Country Gentleman*. For the information of your many readers I will say that Aubray Hoffman 17 years ago bought a short-horn heifer coming two years old, which did not prove to be with calf. He spent some time looking for a mate for her, and when he found one that suited his notions, they were mated. Their first calf was a heifer; they were mated again, the second calf was also a heifer. The mother and her two daughters (when the second daughter was 5 or 6 years old) made in one year 1013 lbs. of butter; the youngest cow making in 7 days, 22 lbs. of butter. The trial began on March 27th, and ended on the 27th of March, the next year. The old cow had been milked 5 months when the experiment began, the elder daughter had her calf just taken away from her, and the youngest daughter did not calve until the last of May. What they would have made, had they all been fresh milkers on the 27th of March, when the experiment began, cannot be told. The experiment was continued the next year with the same 3 cows, with the addition of a 2-year old heifer, also from the old cow, which resulted in their making 1211 lbs., weighed out in pound prints for market. This strain of cows is very prolific, bringing a calf every year. Three-fourths of her calves were heifers; the heifers have all been raised, and are all good milkers and good buttercows. The old cow is 19 years old, and will soon have her 16th calf, never having missed once, and last year she made in one week 10 lbs. of butter weighed in pound prints for market. The first three cows on the day of the October election, in the year of the first experiment, were weighed on the scales in the presence of the people there assembled, the old cow, Red Rose, weighing 1680 lbs.; the oldest daughter, Hoffman's Star, 1820 lbs.; and the youngest daughter, Hoffman's Dolly, 1760 lbs. From these facts, it seems undoubted that Short-horns, notwithstanding the remarks of other breeders against their milking and dairy qualities will hold their own with Ayrshires, Devons, Holsteins or any class whatever.



ROYAL DEREHAM,—Property of S BEATTY Toronto.

light, but gradually increased in quantity, until latterly, when each animal received as much as it could eat. The following is the result of five weeks' feeding:

Pen.	Weight on entry	Present Weight.	Increase.
1	212	247	35
2	212	301	72
3	217	332	115

Now, as to cost. Peas were charged at from 60 cents to 75 cents per bushel; wheat middlings, \$16 per ton; and house refuse at the rate of 10 cents per pig per week—all which may be tabulated thus:

Pen	Food Consumed in 5 weeks.	Total Cost of food.	Cost per day.
1	421 lbs. of peas	\$4 24	12 cts
2	261 " " "	3.95	11.27 "
3	210 " " wheat	2.72	8 "

And lastly come the profits which are certainly interesting as showing that the only food undergoing any preparation gave the least returns, while that which is usually accounted the most inferior, gave the largest.

Pen.	Value on entry.	Present value.	Profits, deducting cost of food.
1	\$12 60	\$20 82	\$3.98
2	11.60	18.25	2.70
3	10.50	19.92	6.35

No doubt caution is necessary in jumping too rapidly at conclusions. Experiments like these require to be repeated, extended and verified, and it is the intention of the Collego authority, we believe, to follow them out still farther with the same animals. One lesson, however, they teach unmistakably—Take care of the kitchen refuse.

Short-horn Bull, Royal Dereham.

Our cut on this page represents "Royal Dereham" a Short-horn bull owned Mr. S. Beattie, Toronto. He was calved May 18th, 1873; bred by Mr. H. Aylmer, West Durham Abbey, Norfolk. Sire Royal Broughton 27352; dam Mistress May by Prince of Rosedale 24837; g. d. Mistress Margaret by Paterfamilias 18521; g. g. d. Modred by Valasco 15443; g. g. d. Mistress Mary by Baron Warlawy 7813; g. g. g. d. Water Witch by Royal Buck 10750; g. g. g. g. d. Heccato by Hopewell 10332; g. g. g. g. g. d. by Hamlet 5126. The bull is of pure Booth blood, and in color red, with a little white.

NEW SPECIES OF WOOL-BEARING ANIMALS.—From the Pacific Steam Navigation Company's steamer, *Aconagua*, recently arrived in Liverpool from the west coast of South America, have been landed two new and distinct breeds of sheep. The first are two fine white-wooled sheep, each having four long massive horns, two of which have a forward curve over the head, while the other two curve downwards under the eyes, giving the head a singular appearance. Of the second, which are said to be a species between the Llama and Alpaca, there are three, one male and two females, which are thickly covered with long dark-brown, but exceedingly fine, hair or wool, which is highly prized by the native Indians for the manufacture of their more delicate fabrics. The male stands about three feet high at the shoulder.

The Dairy.

Cheddar Cheese in Canada.

EDITOR CANADA FARMER:—I desire through the medium of your valuable paper to bring before the notice of the Dairy interest a few facts concerning Cheddar cheese as manufactured in English dairies and factories, and endeavor to show that, as a system, it would become profitable to those who may adopt it in your enterprising Canadian Dominion.

Those who have at any time perused the great standard work on associated dairying, "Practical Dairy Husbandry" by the Hon. X. A. Willard, will remember the importance he attaches to the Cheddar system, as he found it at the residence of my father-in-law, Mr. Joseph Harding, of the Vale Farm, Marksbury, Somerset, and other English dairies. And the cheese show at France, Somerset, last autumn, completely outstripping as it did, those of former years in the fine quality of dairy goods exhibited, only added one more grand proof to the already established fact, that for fine texture, mild, mellow flavor, and great keeping quality, the Cheddar cheese is surpassed by none, and equalled by very few, if any.

When the first factories were erected in England, they were run on what is here known as the "American" system, its principles being those which Mr. Willard advocates in the work above mentioned, and it was not until 1874 that the first successful season at the Mickelaver Factory, Derbyshire, under my brother-in-law, Mr. Henry Harding, brought to light the fact that, by following out the essential principles of the Cheddar system, modified to suit the alteration of circumstances, an article equal to the average private dairy produce could be made in these establishments. During that season Mr. Harding made cheese at Mickelaver on the same principles which had made the Cheddars of Marksbury famous, and, exhibiting at the Derby Agricultural Show, he carried off the first prize of £10 or \$18. Then another factory was built at Etwall, about two miles distant, and the old one which was inconvenient, being an old school house fitted up, was abandoned, the new establishment being run by Mr. Harding till the close of last season, when he left England to inaugurate the system in Australia. Early in the same year a factory was built at Brailsford, about 7 miles distant from Etwall and Derby, the best building in all respects of its class in England, and capable, with a little alteration, of running the milk of 1000 cows: and in this I made cheese and whey butter from June 25th to December 4th, with success. I may here say that the Etwall and Brailsford factories are the only ones in which the Cheddar cheese is made as yet. The standard price given for milk was 13 cents per 10 lbs., and if, after expenses had been subtracted from receipts, there remained a balance in hand, this was to be divided pro rata among the patrons, a committee of seven having the control of affairs. As the balance sheet has not yet been published, whether or not such a balance exists, I cannot say. The cheese produced sold at 16 cents per lb. in September, and 15½ cents in November, when quotations had considerably fallen. In the manufacture of whey butter we were especially successful, turning out an article which realised prices gradually rising from 24 cents to 40 cents per lb., 10 cents in advance of the prices gained by any other factory; and toward the close of the season, within 2 cents per lb. of the best milk butter sold in Derby market. Now, it is well known here that under the American system, as pursued in various English factories, this fine quality of butter cannot be produced, as the whey is to a certain extent spoiled in the process of cheese making. Whether or not this is the case in Canada I am not aware, but I have an idea that the manufacture of whey butter in your factories is not supposed to pay well.

But, while I hold out the great advantages to be derived from the adoption of the Cheddar system, I must fairly state also its disadvantages. First among these comes the fact that we do not produce quite as much weight of curd per gallon of milk as the American makers, the reason of which is that the latter leave a greater amount of whey in their curd than Cheddar makers, and consequently, in that case, the American dairymen have an advantage over us as far as concerns weight and money. But this objec-

tion is compensated for by the keeping quality, as will presently be seen. The effect of the whey remaining in the one class, and being separated in the other, is marked throughout. The cheese of American make, from which, as I said, the whey is not thoroughly separated, develops acidity much more rapidly while in the vat, cures in from 30 to 50 days, and in from 3 to 6 months after, has lost its original mildness and acquired a sharp, singy taste; while the Cheddars require from 40 to 65 days to ripen and afterward retain their pleasant mild flavor for a period of from eighteen months to two years. Now it is evident that if on the one hand there exists the first objection, that less curd is produced by the Cheddar method than the American, and the second disadvantage of a longer time for curing, with the attendant need of more spacious curing rooms, and more turning (which latter form the remaining objections), there are also the advantages of a high priced article, and no risk in keeping, on account of overgorged markets which brought the dairymen of America such serious losses last year.

Having resided in Canada, I can confidently assert that the climatic influences would be rather in favor of the successful carrying out of the Cheddar principles. The clear air of your healthy country, together with your superior arrangements for cooling the milk on the home-stand, would, without doubt, remove the risks which their absence would cause. I do not look for the general adoption of the system in Canada, as there are various classes of consumers, all of whose tastes must be provided for; but I am satisfied that, in very many cases, the introduction of the Cheddar make would bring good returns.

I cannot at this time go into a description of the system itself, but must leave that for a future number, trusting that the readers of the "Dairy" section of the CANADA FARMER will give the subject the consideration it deserves. Brailsford, Derby, England JNO. OLIVER.

Drying off Cows.

Col. S. D. Harris, in the *County Gentleman*, files his objection to the usual method. When the milk shrinks so as not to fill the bag once a day or once in two days, people as a rule think it safe to neglect it and leave the cow to go dry. Upon this question Mr. Harris says:

The little milk which is secreted must be taken away, or it will work mischief in the organs of the udder, too serious to be overlooked by the careful dairyman. It is one of the processes of nature that when matter of this kind is deposited (unless it be in large quantity), it must be soon removed, or it is reabsorbed into the system; and when matter is once perfected, as in the case of milk, it is no longer congenial to the system, and if not taken away, it becomes a deleterious element for reabsorption, poisoning instead of feeding the animal.

Thus you will find in the udders of cows thus affected, hard lumps near the base of the teats, which are caused by the solidification of putrid milk, left there in drying up the cow the season before, and the cow will never get over it; but when these organs encounter any difficulty in the season of flush milk, this lump will be the nucleus of inflammation, just like a thief who is already secreted in a house, ready to help another who is to break in from the outside. To be free from all such troubles, the cows should be carefully watched for weeks and months after the regular milking is stopped, and the teats tried to see if there is milk to be taken away. This operation should be performed at irregular intervals, so as not to invite a regular secretion of milk, until the milk vessels cease to lead anything in that direction.

Glistening Butter.

Miss M. says the editor of the *Berkshire Eagle*, is the best butter maker in Massachusetts. That is her father's assertion, and I can vouch for it.

"Take some butter," said the farmer. "M. makes the best butter in the country."

I took some. The roll showed care, and glistened like glass, and tasted beautifully.

"What do they pay for butter in your place?" asked the lady, in monotone.

"I think 28 and 30 cents."

"Wal," said the farmer, "I git 40 cents. I've got an agreement with two families in your place, to furnish each 20 pounds of butter a week, for five years, at 40 cents a pound."

"Change in the market does not affect us," remarked the damsel, slowly speaking.

"Yer see that glaze on that butter?" said the farmer proudly. "That's what sells it. Your big tobs like that shine. I never see any, only my butter that was glazed."

"How is that done?" I asked.

"Well," said the lady, "I am not adverse to telling, now that we've made this five years' agreement. Formerly my success was a mystery, but now I don't mind telling." I always find it good policy to flatter old maids, and so I expressed a desire to know how she made and glazed her butter. The truth is, I was not highly interested, but—it is excellent to hear the discourse of a real old maid, you know!

"I go by rule," she said artlessly fingering a bean. "My milk I set just two inches deep; my cream I skim the third day; I churn Friday; my cream is just so hot. In five minutes it comes, I then sponge out the buttermilk. It stands in the bowl till night. I then make it into balls and stamp them. They are spread in rows on a wire-cloth shelf—and are done. I have usually twenty-five pounds at a time. I then glaze each ball, as you see this one is, to polish them."

"The way to do it, is this; I take a pint of water, and dissolve in it a teaspoonful of sugar. I have this hot milk butter in on a wire shelving. Then I turn it on each ball. When it touches the butter it just melts the outside, and when it cools it is just icy."

She talked by jerks, and very fast. This is the first I have heard of "glazed butter," and when I saw the glassy polish on the rolls, I resolved they were worth forty cents.

Milking Kicking Cows.

Judging from the numerous plans which we from time to time see recommended in the agricultural papers, for milking kicking cows, the class must be numerous. A cow that is a kicker is apt to be a good one, and if so, every effort should be made to reform her. I never owned but one cow that was an inveterate kicker, and have tried the various remedies which I have seen recommended with the following results:

Remedy No. 1.—"Tie up the fore foot of the cow on the milking side, and when she attempts to kick, she will fall down and soon become disgusted and abandon the habit." I have tried this remedy thoroughly and pronounce it worthless. A cow can balance herself upon two legs and kick just as well as a man can when standing upon one leg. The "falling down" part, if it occurred, would prove to be nearly as bad as the original vice.

Remedy No. 2.—"Tie a rope or strap around the cow's body, immediately in front of the bag and extending over the flank and loins. If you cannot tie or girt it tight enough, put in a twi-er, and the cow will stand." The inhumanity of this remedy should be sufficient to prevent its adoption. But it is not effectual, unless the girth be twisted tight enough to paralyze the nerves and destroy the sense of feeling. I have seen cows made almost frantic in attempting to apply this remedy. I never attempted it myself but once.

Remedy No. 3.—"Tie both hind legs together as closely as possible, just above the hock joints." This remedy has the advantage of throwing the bag well forward in convenient position for milking. It will also prove effectual in most cases. But my cow when she found she could not kick with one foot at a time, fell to kicking with both feet at once, sending her heels high in the air, equal almost to a horse. This plan did not answer for her.

Remedy No. 4.—"Chain the cow by the neck to the manger, if in the stable, or to the fence if without, so that the side of the animal opposite the milker will be supported by the fence or wall, as the case may be. Then take a strong rope, five or six yards long, double it and noose it in the centre around the hind leg upon the milking side just above the fetlock joint. Then pass the other end of the rope through a ring or staple in the wall, or the bottom post hole in the fence, draw the leg back to the desired position and fasten the rope over the top of the post, or on a hook in the wall on a line with the cow's back. I have found this plan to be both safe and effectual. The cow will not resist after two or three applications. My cow, as soon as the rope is around her leg, puts herself in position and stands contentedly chewing her cud while the operation of milking is performed. This remedy has the merits of simplicity, safety and efficiency. Try it.—*Cor. Practical Farmer.*

EXTRACT OF RENNET.—In a recent number of the *Milch Zeitung* it is stated that this extract is now so prepared that it is perfectly pure, and will keep for years. Its purity insures perfect freedom from danger of bad cheeses originating in the use of bad rennets. The extract can be made of any desired strength, and the operator can have any desired relation between the time of coagulation, the temperature at which the coagulation shall take place, and the quantity of extract used; for example, a quart of milk can be coagulated in 20 minutes at a temperature of 85°, or 25 minutes at 86°. The extract can be used with equal convenience with large or small quantities of milk. At one factory in France this extract has been in use for 10 years. In Copenhagen one firm worked up, last spring, over 20,000 rennets, and sent each month from 2,000 to 3,000 quart bottles of the extract to Denmark and Sweden. It is prepared in both the liquid and solid form, but the former is generally preferred.

Veterinary.

Removal of the Uterus from a Cow.

On the 22nd May, 1875, while practising in the village of Florence, county of Lambton, Ont., during college vacation, I was called to see a cow, which the owner described as being in a very bad state, having, as he said, her whole inside turned out and lying behind her. On inquiry he informed me that she had calved on the previous evening and that in the morning he had found her in the state mentioned. Having received this information, it was an easy matter to diagnose the case, even without seeing it, as that of INVERSION OF THE UTERUS.

I found the cow to be of medium size, about six years old, and, contrary to my expectation, in very good condition, with not the least sign of previous debility. On examining the pulse I found it 53 and somewhat full. The uterus was completely inverted, with the entire fetal membranes attached. I immediately procured a sheet, and lifted the whole mass thereon, and then proceeded to detach the after-birth, which, from its very firm adherence to the uterus, I found to be a somewhat tedious operation. There was considerable hemorrhage, owing to the unavoidable laceration of some of the cotyledons, which are well known to be very vascular. After removing the membranes, I bathed the uterus with tepid water, and carefully removed from it all foreign substances. I then bathed it with water into which I had put some tincture of opium, and, after getting the animal on her feet, proceeded, with the assistance of two men and the sheet, to return it by pressure, first on the neck and afterwards on the fundus. I succeeded in doing this with comparatively little difficulty. I continued to manipulate the uterus for some time after returning it, with the view of exciting its contraction, and of making sure that it was properly returned. Having nothing at hand to make a truss, I inserted three strong and deep sutures through the lips of the *vagina*, raised the animal's hind parts considerably higher than the fore, and administered two ounces tincture of opium, diluted with about one quart of water. The narcotic effects of the opium were very soon manifested in a marked degree. After returning the uterus, I remained about an hour and a half, during which time there was no straining of any consequence. I then gave instructions to watch the cow pretty closely for at least twenty-four hours, and also, if anything went wrong, to lose no time in letting me know. Having heard no word for three days afterward I concluded that everything was right, but was rather disagreeably surprised, at the end of that time, to receive information that the cow was as bad as ever, and had been so for at least two days, and was requested to go again and see her if I thought I would be of any service. So I determined to go, intending, if no other treatment would be of any avail, to remove the uterus. I found the animal in a very debilitated condition, a large portion of the uterus being in an advanced state of decomposition, the smell of it being very offensive, and the chickens and turkeys very busily engaged pecking at it. The cow was in a very weakened condition, unable to get up without assistance, and staggered when she walked, the pulse fifty nine and quite weak, but regular. Seeing that there was not the least probability of saving the animal's life without removing the uterus, I immediately proceeded to do, by first administering a stimulant composed of whiskey $\frac{1}{2}$ pt., nitrous ether 3 oz., water 1 qt., and then putting a ligature of strong hemp cord very tightly around the neck of the uterus, exposed it about one inch external to the ligature. There was no hemorrhage, the ligature effectually preventing it, but, notwithstanding, the operation seemed to give the system a very great shock, which was manifested by the great exhaustion following it. The day being very warm no doubt aggravated these symptoms very much. I dressed the wound with carbolic acid lotion of strength 1 to 40, administered more stimulants, and applied cold water to the head and loins. In about three hours after the operation she began to revive a little. I then prescribed febrifuges and stimulants to be given twice a day for two or three days, also a blanket to be left within her reach, and the wound to be dressed twice a day with carbolic lotion of the strength

above-mentioned. I then left with the idea very firmly established in my mind that the cow's recovery was extremely doubtful.

However, at the end of three days I was very agreeably astonished to find that she was not only alive, but mending as fast as could possibly be expected. Of course she was still very weak, but the pulse had gained its strength and was a few beats slower, her appetite was improving a little, but the secretion of milk was, as might be expected, almost suspended. I advised the use of stimulants and febrifuges to be continued in somewhat smaller doses, and after a few days, prescribed tonics. She still continued slowly and surely to improve, until, at the end of four or five weeks, she was almost as well as ever; her appetite had entirely returned, and so had, to a great extent, the secretion of milk; she also, afterwards, laid on flesh quite fast.

There was in the above case no apparent cause for the inversion of the uterus. I may mention that the animal was of nervous temperament, and judging from the looks of the calf and the very firm adherence of the after-birth to the uterus, I imagined that parturition had been somewhat premature.

Toronto, 19th February, 1876. W. A. DUNBAR.

The Ophthalmoscope.

Very small cataracts in the eye are discernible only by the aid of this instrument. In order to examine with the ophthalmoscope, much practice is requisite, and the veterinary surgeon should become an adept in its use before resorting to it in an important case.

A dark place is necessary, and the examination is much facilitated by first dilating the pupil with belladonna. The examiner is to stand in front of the horse, with the instrument in his hand. An assistant stands near the animal's shoulder holding a candle. The examiner then manipulates the instrument until the light of the candle is reflected into the horse's eye. In many cases this is sufficient to bring an opacity of the lens distinctly into view—a cataract resembling a dark spot in the illuminated eye. But should this not prove sufficient, the eye may be agitated by the lens which accompanies the ophthalmoscope, and the examiner can limit his vision to the eye, by looking through the small aperture at the back of the instrument.

T. G. ALEXANDER, V.S.

Monro Road, Ont.

Congested Liver in Horses.

The recent changeable weather, the cold scorching north-east winds, the damp, raw air, have during the past few weeks produced a great deal of sickness amongst horses. Colds, sore throats, and pleurisy attacks have been common. Many horses, turned out to work, dull, shivering and out of sorts, after a few hours exposure to work and weather, come in chilled, blowing, suffering from congested lungs. It is a prevalent but senseless idea that colds, like in man and beast, may be worked off, and that care and coddling, a day's rest, a few washes, and an external stimulant dressing, are mere waste of time and trouble, even when signs of impaired health have distinctly shown themselves. But the animal enfeebled by cold or by congested or relaxed throat is unfit to be exposed to winter weather or hard work, and hundreds of slight and temporary ailments by neglect or bad management become serious or permanent.

Be it dies the more ordinary colds, sore throats, and influenza, a good many horses are now suffering from congestion and some from chronic inflammation of the liver. Such attacks are usually introduced with the usual symptoms of cold—with dullness, shivering, irregular surface heat, increased temperature, and capricious appetite. There may be injected nostrils, sore throat and cough. Often the animal is sun and sore all over. Frequently the other symptoms are ushered in by an attack of colic, and more or less abdominal pain may continue. But the special features showing themselves more notably after a day or two, and pointing to implication of the liver, are yellowness of the mucous membranes, torpid bowels, high colored urine, a soft sluggish pulse, and considerable debility. Judging from the symptoms during life, and post mortem appearances of a few fatal cases, there is

general congestion of the liver, with redness, torpidity, and congestion, more particularly of the mucous lining of the organ and communicating ducts. Popularly the complaint may be described as "cold in the liver." The symptoms usually last for several days, the appetite requires encouraging; it is difficult to keep the animal comfortably warm; the impaired strength takes some days for recruitment.

Unless neglected or mismanaged, the cases are seldom fatal. The patient should be warmly clothed, his legs bandaged, the clothes and bandages should be stripped off twice daily, and the skin well rubbed over to promote circulation, and when attainable, fresh clothing, aired and warmed, replaced. A few carrots or swedes, bran mash, boiled barley, or a handful of green hay, are the fitting food. Usually more thirsty than hungry, the horse should have standing by him luscious tea, barley water, or any other such simple, non-stimulating drink, and he may have cold water if he prefers it. To call forth the action of the torpid bowels give a pint of luscious oil, and twice or thrice daily use soap and water or bran water clysters. A morning draught containing about an ounce each of Epsom salt, ammonium acetate solution, and potassium chlorate will encourage the action of the bowels, abate fever, and promote cutaneous action. Avoid active purgatives, which in the irritable state of the bowels and the general enfeebled state, may bring on troublesome diarrhoea. There is some diversity of opinion as to whether mercurials should be used in such cases. A single small dose of calomel with the luscious-oil in the outset of the attack does no harm; but whilst the liver is congested, repeated doses of mercury or other liver stimulants are not advisable. Much advantage, however, results from the frequent stimulation, by mustard or other irritant embrocations, of the abdominal surfaces overlying the liver. When the bowels have responded to the action of the physic and have become more natural, if the patient is not more cheerful, warmer, and showing better appetite, give him three or four times daily such tonics and stimulants as an ounce each of ammonium acetate solution, sweet spirit of nitre, and powdered gentian.—N. B. *Agriculturist*.

GRUB IN THE HEAD.—Dr. N. S. Townsend of the Ohio Agricultural College, in a recent address said that grub in the head was caused by a small fly that lays its eggs in the nostrils of sheep, and from which small worms hatch and crowd up into the head. He said that he thought it seldom proved any injury to the sheep. Recommended as a remedy to blow tobacco smoke up the nostrils. He then spoke of the frequent and annoying dying of lambs at about one month old without any apparent disease. He thought it was caused by conglutination of milk in the second stomach of the lamb, produced by having taken too much milk. Recommended turning the ewes on a thinner pasture to reduce the quantity of milk, and if discovered in time, give the lambs ginger tea with a little salts mixed. Others spoke of this lamb disease, recommending sulphate of iron with salt and ashes as a good remedy, and others thought that liberal salting of the ewes and lambs both, was a good preventive.

SHEEP BOT FLY.—This is a much smaller species than those infecting the horse or ox, but none the less formidable or injurious. The female, like some other kinds of flies, retains her egg in the oviduct until they hatch; at least she has been known to do so, and instead of depositing eggs on the nostrils of sheep, lays there minute maggots, which immediately begin to crawl upward. These larvae or maggots remain in the nostrils nearly or quite a year, and cause great inflammation, resulting in a disease known by farmers as "Grub in the head." During the "fly season" it would be well to frequently examine the sheep, and remove the maggots before they have ascended out of reach. We might continue these brief sketches of insects injurious to animals almost without limit, but the above will suffice to show our readers that the origin of a few of the diseases affecting farm stock is not entirely enveloped in mystery.—N. Y. *Sun*.

RUPTURE IN THE HORSE. A rupture with an opening no larger than $\frac{1}{2}$ inch may be often cured by returning its contents into the abdomen by manipulation, and then raising an active blister on the part with swelling enough to form a retaining pad and prevent protrusion. Cantharides, 2 drams; oil of origanum, $\frac{1}{2}$ dram; lard, 1 ounce, will do if well rubbed in, and repeated, should the first application prove ineffectual. Should it resist this treatment it may be easily overcome by the use of wooden clamps like those used in castration. The greatest care must be taken to return all the contents of the sac into the abdomen, the horse being turned upon its back if necessary, and the clamps, having been applied over the skin close up to the opening, are to be drawn as tightly as possible with strong pincers, and then tied with a strong, well twisted cord which will not yield. The object is to obliterate the sac, and the clamps should be left on until they drop off together with the imprisoned skin. The edges of the skin above will then be found to have united, and a closure of the wound to have been effected. During any form of treatment it is desirable to keep the patient on a spare and somewhat laxative diet.—*English Farmer*.

The Poultry Yard.

Poultry—The Whole Question.

EDITOR CANADA FARMER.—If any of your subscribers will inform me how to make fowls pay, what kinds to keep, what sort of house to build without being too expensive, how to feed, what the cost of feeding will be, what should be produced by any given number of birds, and other particulars respecting the keeping of poultry—such as how to judge the best paying fowls, etc.—they will confer a favor. For the past five years I have been keeping fowls in this city, but have not been able to make any profit from them for three years. I kept the Light Brahmas, but changed them two years ago for Dark Brahmas, and I find that I lose more by the latter than by the former. Papa has bought a farm; we move on to it this month, and any information afforded me through the FARMER will greatly oblige

JANE J.

We submit, in reply to the above, the following observations from one who has had large experience in the business, and whose views may therefore be accepted as reliable. He says: To build a fowl house, choose a site that lies high and dry; if sheltered on the north side, so much the better. Get some cedar posts, eight feet long, such as are used for fencing. Dig holes in two parallel lines, seven feet apart, three in a row from east to west, and two feet deep, so that each post will be seven feet distant from the next to it. Then sink a seventh hole between the two at the east end. Put in your posts, and lay a 14 foot scantling, 2x4 inches, along each row, nailing fast to the posts. Across these lay other six pieces of similar scantling, from north to south, one at each end, and the remaining four at equal distances between the ends. This will give you, when the roof is on, a kind of open loft which, filled with straw, keeps your poultry warm in winter; while, during summer, the straw can be removed, and you have a roosting place for your chickens. Next lay on the roof, like an ordinary cottage roof, to fall both ways. Nail inch boards on the outside. Hang your doors on the seventh post. Put in a sash, with very small panes of glass, at the end opposite the doors. Put up your perches, letting them run from north to south. They should be made of three strips of inch wood, nailed together in the shape of a triangle, A, with a hole right down the centre. They are to be fastened in their places by nailing two strips to the siding in the form of the letter V, but at a somewhat more acute angle than the perch, so that by pressing it downwards the perch may become wedged. Adjusted in this manner, the perches may be removed at pleasure, and if, on their occasional removal boiling water be poured through them, it will most effectually destroy lice which, unless attended to, would soon set up your hens from laying. Don't paint or oil these perches. Let the nests lie against the two sides of your pen on the ground. They should be built in pairs. Cut a piece of 12 inch board, 30 inches long, for the bottom, one piece 2 feet long for the front; and one piece 11 inches wide, and beveled in length from 15 inches behind to 12 inches in front. Lay the bottom piece on the ground; nail the front piece to it; then divide it in the middle by the 11 inch piece, putting the 15 inch end against the siding, and the other to the front. Then nail a second strip at each end to prevent the hen from scratching out the nest. Next cover it over with a board on which you have previously nailed two strips. This will assist heavy hens in reaching the perch, and also prevent the droppings from getting into the nest.

When your hens want to sit, let them sit in the nests they lay in. This can be easily done by putting a piece of wood, similar to the one that divides the nests, at the end of the 30 inch piece, and making two holes through the lid, into which you can put two 2 inch nails to keep the board in its place. By this means the sitting hen will have plenty of light and air, and the other fowls will not be able to annoy her. Put up your spouts. Then bank the outside up with soil covered with turf. Bank every side except the door and the window, both of which you can at any time protect against frost by placing bundles of straw against them.

This pen will supply all the accommodation required in summer for fifty fowls. In the fall, if you want your fowls to lay in winter, add a yard of similar size and similarly built, but the roof on the south side to be wholly or partially covered with glass laid on in wooden grooves, each pane to overlap the under one one inch. Here the fowls will be able to get the sun without getting into the snow and wind. They should be fed in this yard.

The largest profit with the least trouble is made with eggs. A good hen, under ordinary circumstances, will lay 150 eggs in a year. The best breeds are the Leghorns, Spangled Hamburgs, and Black Spanish. The Hamburg lays the largest number, but its eggs are small. The others lay fine large eggs, and 200 per annum is not an enormous yield for one hen, if properly housed and well fed in winter.

One bushel of Indian corn will feed one fowl of the last-mentioned breeds well for a year, if it has a run where it can get grass and insects. If you do not want to keep any particular breed, choose birds with large combs, black legs, white ears, color perfectly black. Avoid yellow legs, red ears, and crooked breast bones. Take the feet in your hand, and if they feel stiff and hard reject the bird; they

should feel soft and smooth. If the comb is not red, examine it closely to see that there is no disease about it.

If you want chickens give the preference to the Light Brahmas. In choosing get plenty of Dorking blood in them, though when mixed slightly with the Cochins they are more vigorous than pure Dorkings. Always avoid yellow legs and crooked breasts. But the most profitable of all chicks are young ducks. In ten weeks they are fit for the market, and should be killed at that age. They bring as high a price as a 4 or 5 month chicken. You can also take them away from the hen as soon as hatched, and have her laying again five or six weeks sooner than with chickens. The best duck for this process is the White Aylesbury; it grows quickly. The Roman Grey and Cayuga Black are good ducks, but, to kill before they shoot the second feather, give the preference to the Aylesbury.

Game hens, in the second year, are the best for sitting. The Brahmas often sit well. If you have any doubt about a hen sitting, put dummies under her for two or three days, with the end board up. This will make the hens that laid in the same nest find another. If you then find her bust feel hot to the hand, take out the dummies and put the eggs under her, first marking them so as to detect any stray eggs that may be laid amongst them. Remove the end board every night and morning when you feed, and put it up again when the hen has returned to the nest. Never take her off; let her consult her own convenience in that respect, and act accordingly. If you set a number of hens, put two or three to sit at the same time. You can then, if you have small clutches, put two to one hen. Put the other hen under a crate and she will forget the chicks in two or three days. Or, you can take a lamp into the pen after dark, when your hens have been laying nine or ten days; examine the eggs; take out the bad ones and put all the good ones under two hens. Put fresh eggs under the third. The good eggs are easily distinguished from the bad by being opaque when held between the eye and the lamp, the bad ones being clear. Put the bad eggs in a cool place, and if they have not been set more than nine or ten days, you can boil them hard for the chicks when they hatch. By this means you can almost invariably get good clutches.

If you keep only a small number of fowls, the Black Red Games are good birds (if not mixed with Malay). They sit well, lay well, are good, hardy fowls. If well managed one hen will hatch one clutch of ducks early, one of chickens late, and lay over one hundred eggs in the year. But their sitting propensities render them very troublesome if kept in large numbers.

When you commence, buy at once, if you can, all the fowls you want, or even more. Do not purchase a few now and again, as every time you add fresh ones the others are disturbed. By having a few extra you can remove some you do not like, and still have the desired number. Keep one cock to every 10 or 12 hens. Set one about two or three years old, and have the other chickens. If your neighbors keep fowls close by, let your old cock be good and strong in order that he may be able to prevent depredators from gaining an entrance. If a strange cock should enter he will surely be followed by his hens, and these, by mixing with yours, will as surely stop them from laying.

In feeding, the first consideration is grit. The best grit is smooth water-washed stones about the size of barley corns. If your fowls are allowed to roam at will, they can generally, in summer, get sufficient, but not always, and if many an unsuccessful keeper of poultry would cut open the gizzard of one of his fowls, after killing, he would find it filled with matted husks and the hard fibres of roots and grass, but no grit. Perhaps a few buttons, bits of bone or coal, that the hen may have picked up for want of something better to assist her digestion, may be met with; but he should find the gizzard about one-third full of small stones. If he does not, then his fowls need grit. It is just as necessary to them as teeth to himself.

The best grain to feed is corn. One bushel will feed any of our small breeds for a year, without adding any other food than the fowl can pick up on a good grass run. Corns are first-class feed in summer, mixed with curdled milk, or water. Always give your fowls as much grain as they can eat before they go to roost. If you find them moped, stopping on the roost in the day time, and not generally inclined to move about, give them a few peas—say one feed instead of corn—give peas alone unmixed with anything else. If they cannot get sufficient insect food, give lean raw meat. Liver or pluck, cut up into small pieces, will pay at any time by adding to the number of eggs. You should also change the food occasionally. Wheat makes a good change; barley also is very good; but for regular feeding none of them is equal to corn. Always mix some of this latter with the other grains, when introducing changes. Give plenty of good, clear drinking water, in shallow pans, so the chicks won't get drowned.

In making nests, put in first a shovelful of ashes or dry sand, mixed with one handful of powdered sulphur. Then make the nest with straw and put in a dummy. Every time a hen sits remove the straw and put in fresh.

The best feed for your ducks and chickens when hatched is hard boiled eggs chopped fine, and moistened for the ducks. After the first day, add a few crumbs of bread to the egg. On the third or fourth add rice, boiled for the ducks, raw for the chickens. You can then, as soon as they will eat it, feed your chickens wheat, and your ducks shorts mixed with water or curdled milk. When your ducks are seven weeks old, mix with their shorts grease or chandlers' waste (the refuse of rendered lard), to be pur-

chased of any butcher, and you will find your ducks fat at ten weeks old. Pen them for the last three weeks, and give water only when you feed.

Twelve ducks will eat, in ten weeks, 10 eggs, 3 lbs. rice, 100 lbs. fine shorts, and 15 lbs. lard waste. The best time to hatch chickens is April, if you intend keeping for two years, and June if only for one year. Generally speaking, it is best not to keep them over two years laying.

Toronto, Ont.

W—W—H—.

The Apiary.

How to Secure Premium Honey.

Dr. P. A. Baker, in the *Beekeeper's Magazine*, publishes a plan to secure the largest quantity and the best honey, which is well worthy of trial. The plan is simply to keep a very strong colony queenless during the greatest flow of honey. All apiarists know that a virgin swarm will work with more energy in building comb and storing honey, than one with a full supply. It is not uncommon for strong families, with everything needful for storing honey in surplus boxes, to loaf about the hive, until a few empty frames are given between the full ones, when they will soon be filled; but, being in the queen's chamber, she immediately performs her maternal duty, and you get no honey. The law is immutable, in their allowing no empty space between broad combs, and the law impelling the bees to fill the space with comb, acts with like force in indicating to the queen her duty. By virtue of cause and effect, if the entire hive is made into space, it is but fulfilling that law for the bees to promptly fill it with comb and honey, if, perchance, it is in abundant supply, but madam queen being present, we must allow a considerable force to assist in attentions to her royalty; dethrone her and supply the colony with material to make a new one, and yet allow none to mature for a period, and we shall have our boxes filled with the beautiful nectar. The operation is to get two large swarms, without queens or comb, into a hive filled with empty sectional frames or honey boxes, and give one broad comb at one end of the hive, and before the new queen is hatched, remove the comb and give them another. When the second has become fertile, the greatest flow of honey being over, remove the honey frames or boxes and fill the hive with combs or empty frames, as the fall season for honey may indicate. The queens and broad combs can be utilized to advantage, which any intelligent apiarist will understand.

The Cause of Natural Swarming.

The *Encyclopaedia Britannica* gives the cause of natural swarming as follows. We are now to give our attention to the migration of bees, by which new colonies, similar to that which originally peopled the parent hive are founded. The main causes of this phenomenon are sufficiently obvious, but it does not so clearly appear to what circumstances it is immediately owing. The increasing population probably occasions inconvenience from the want of room, the increase of heat and the greater vitiation of the air; inconveniences which become still more serious as the summer advances.

Kalder gives the following: The cause or causes which determine the issue of a swarm seem to be enveloped in obscurity; probably there are none which can be said to determine the point absolutely. The crowded state of the hive in hot weather appears to have taught them that when their hive becomes full, a portion of them must emigrate and find a new home. Bees generally swarm for want of room.

Mr. Quinby writes. I have found the requisites for all regular swarms to be something like this: The combs must be crowded with bees; they must contain a numerous brood advancing from the egg to maturity, and the bees must be obtaining honey either from flowers or artificial sources.

Recognition of Color by Bees.

The following is an extract from a paper by Sir John Lubbock on "Bees and Wasps," read before a meeting of the Linnæan Society, in London. I found that bees soon accustomed themselves to look for honey on papers of particular colors. For instance, on September 10th, I placed a bee to some honey on a slip of glass on green paper, and after it had made twelve journeys to and from the hive, I put red paper where the green had been, and placed another drop of honey on a green paper, at a distance of about a foot. The bee returned, however, to the honey on the green paper. I then gently moved the green paper, with the bee on it, back to the old place. When the bee had gone, I replaced the green paper by a yellow one, and put the green again a foot off. After the usual interval, it returned again to the green. I repeated the same proceeding, but with orange paper instead of green. It returned again to the green. I now did the same with white paper; it again returned to the green. Again I tried it with blue; it again came to the green. I then reversed the positions of the blue and green papers, but still it returned to the green.

The Agricultural matter published in the WEEKLY GLOBE is entirely different from that which appears in THE CANADA FARMER.

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The Canada Farmer

TORONTO, CANADA, APRIL 15, 1876.

Farmers' Boys and the Schools.

Apropos of "Sarawak's" communication upon this question, which appears elsewhere, comes a letter from another correspondent asking "What is the reason that, as a rule, farmers' boys are not as well educated as others of their age?" adding "I believe our country teachers will compare favorably, for education, and aptitude to teach, with those of villages and towns." We apprehend the difficulty is not altogether as "Sarawak" states it. There is undoubtedly considerable force in his remarks about the "Programme." We believe that in the rural districts, it has been productive of more harm than good, but, in other respects, the backwardness of rural education is to be attributed not so much to inefficient teachers, as to irregular attendance on the part of pupils. The usual plan of utilizing a boy's muscles as soon as he can hold the plough, and schooling him only in winter, may be a very good one to the farm, but it is certainly very bad for the boy's mental welfare. His education is received in snatches, to be almost, if not altogether, forgotten in the intervals, and he returns to school every successive season just about as rusty as when he began. His classmates of former sessions, now far ahead of his attainments, leave him in the lurch, and he is often obliged to take his stand amongst comparative children, that reach only his elbow. "Dick's" dignity is hurt. Human nature is human nature; he becomes discouraged, piqued, mortified, and finally disgusted with school life. In the matters of school accommodation and apparatus, rural sections may be, and very probably are, behind the cities and towns, but, in so far as the good qualities of masters are concerned, we believe the country to be just as well and efficiently supplied as the towns. Even a third class teacher of the present day (who has come honestly by his certificate) should be able to impart a fair, initiatory English education, quite sufficient for ordinary business purposes, or for entrance upon the higher studies of science, and the professions. But the real obstacle lies where we have seen, in haphazard attendance, and, so long as that continues, so long will it be followed by unsatisfactory, though natural, results, just as surely as effect follows cause. How simple the remedy too, would parents only adopt and apply it. It is to keep the boys continuously at school until their education is completed, or rather until they leave it for good. We venture to assert, and we appeal to all experienced teachers, as to the truth of our assertion that a pupil, if kept unremittingly at school from the age of seven until he is fourteen years of age; (and we think this latter is quite soon enough to set him ploughing) will learn more, and learn it better, than in twenty years of the zig zag course which is so characteristic of our Canadian rural schools.

Purity of Drinking Water.

The report of a Board of River Pollution Commissioners recently appointed to examine the drinking water of London, England, will suggest to farmers and others the propriety of considering the location of their wells. It would appear from this report that the flavor, taste and clearness of water furnish no reliable criteria of its purity, but, on the contrary, that these are frequently due to organic pollution. A famous old pump at the "East End" known as the "Aldgate pump" was first attacked by the examiners. It had long been traditional for its clear, sparkling, finely-flavored water. Ailing people sought it out from far and near, luxuriated in its copious flow, and

attributed wondrous results to the healing powers with which they declared it to be endowed. The commissioners, however, thought differently, and correctly, as the sequel showed. Upon applying the analytical test, the water of Aldgate showed its sparkling appearance, and refreshing saline flavor to be the result of impregnation with salts derived from putrefying sewage, which found its way into the well after being partially filtered and decomposed by the surrounding soil. The soil itself was heavily laden with organic matter, which retarded its action as a proper filter, and thus the water was still further polluted. Continuing their researches in other quarters, the examiners found that, with but two exceptions, all the shallow wells of the metropolis consisted chiefly of soakage from sewers and cesspools, and some of them actually had a manurial value of one hundred and fifty per cent greater than that of average London sewage. One or two of the worst had a slightly disagreeable taste, piquant to epicures, but, in the main, they were bright and palatable, enjoying a reputation with connoisseurs quite as high as that of Aldgate. What is the inference from all this? That water may be very bad, and yet seem very good when judged by the taste and smell. Of two wells in a neighborhood, the one most highly reputed may actually be poisonous, while the other may be less pleasing to the palate, just because it is purer. And what is the lesson? To have all wells, whether for man or beast, located so far from anything pertaining to cesspools or sewage, that soakage will be simply impossible.

Philosophy of the Double Window.

Any person sitting near a window on a cold day, will soon become sensible of draughts of air from above. These are frequently very disagreeable, and fraught with injurious results to the individual, such as cold in the head, rheumatism, &c. Naturally enough the first impression is that there must be an opening somewhere, a loose pane, or something disjointed about the framework, through which the external air enters. Strange enough too, the more comfortable the room within, the more powerful the current, and it always appears to descend from above downwards. Now the reason of all this is very simple. There being but a thin film of glass between the cold outer atmosphere and the warm air within, the latter, just at the point of contact, namely the window, is being continually lowered in temperature. Once lowered, its specific gravity of course increases; it becomes immediately heavier than the surrounding air, and falls. Thus a constant current is kept up which is not only perceptible at the window, but at different parts of the room as well, according as it is attracted, repelled or diverted by the doors or fire-place. Now the remedy for such a state of things is of course, in some way, to thicken the film to a sufficient density. But this would require a wholly impracticable quantity of glass; therefore some other substance must be substituted that will answer the double purpose of a non-conductor, and a transparent medium at the same time. Air itself, confined, has been found equal to the emergency. It is one of the very best non-conductors for this purpose that is known. Hence the origin of the double window and hollow walls. The strata of air confined between the outer and inner casings are, through the influences of the cold without and warmth within, kept at a uniform temperature, and thus serve as a check to excess at either side.

But cold currents are not the only injurious effects of single windows in cold weather. They also keep continually draining the room air of its moisture. This is simply illustrated. Take, for example, a jar or flower-pot from your cellar into a warmer room, and in a few moments its surface is coated with vapor, or, in common, but erroneous, phraseology, it sweats. Why? Because the warm room-air, coming in contact with the colder surface of the jar, is immediately cooled by it, and deposits or parts with its moisture upon it. The very same phenomenon—if indeed its simplicity warrants that term—may often be observed on the window panes. They are quite moist; sometimes the water courses down their surfaces in great drops, and not unfrequently in little streams. The commonly received opinion or reason offered is that "the air is very heavy and damp," whereas the facts may be quite the reverse, the atmosphere being dry and light. As in the case of cold draughts and upon the same princi-

ple, double windows will also remedy this latter evil, keeping the air within in its normal and proper state of humidity. And finally, the double window is a great conservator of heat, and consequently, an economiser of fuel in the house,—in these days a most important consideration. Of course the principles already mentioned will afford a sufficient reason for this latter benefit, without our going into detail. We might just add, however, that, if expense is urged as an objection to the use of a second window, a cotton sheet, oiled so as to render it impervious to the air, and stretched over a tightly fitting frame, will answer the purpose just as well, only, it will, to some extent, retard the light. The advantages of the double window may therefore be summed up thus: it tends to check window currents, to keep the air within humid and uniform, and to economise wood and coal.

Deserved Swindling.

Our cousin farmers over the way must be a pretty short-sighted class of people on the whole, if we are to judge from much that is said of them by their own press. Scarcely a month passes without its record of new and transparent swindles—gigantic potatoes, unparalleled new wheat, everlasting goose plums, and a dozen other such unnatural monstrosities—each victimizing its scores or hundreds, (so the report says) despite the fact that fraud in almost every instance, is as plain and palpable as the sun in the heavens. We can understand what it is to sympathize with the honest victim of misplaced confidence, especially when he has brought an intelligent judgment to bear upon the probability of his venture. We can even assent to a certain limited degree of commiseration, when the odds are slightly against that probability proving a successful reality. But when any sane man, in his eagerness to make money, cannot wait to consult his own understanding, but plunges his fingers at once deliberately into the fire, we say let them burn. The lesson will prove a wholesome one to him during the remainder of his natural life. No wonder Yankee swindlers become bolder with such very inviting fields before their ardent gaze. Listen to the latest dodge which we find going the rounds of our American exchanges accompanied by premonitions and cautions, the seriousness of which actually makes them comic:—

"A new system of swindling unsuspecting farmers has been inaugurated. Farmers, look out for it. The following is the game: One man goes to a farmer and represents himself as appointing agents for the sale of a new wire clothes line. He desires the farmer to be an agent. He need do little at all, if he doesn't choose to, but what he sells he is to pay for, and no more. It will cost 2½ cents per foot, and is to be sold for 5 cents. In the course of six months or a year collections will be made. He then gets the farmer's address in an address book. This has other names, and is represented as for reference only. In the course of a few days about 2,000 feet of wire comes to the farmer, and soon afterward Swindler No. 2 drives along with the book, showing that the farmer has actually signed an order for the 2,000 feet at five cents per foot, and claims \$100 in payment. If the farmer demurs, he proposes to compromise, rather than go to the courts, and the result is the farmer settles, and the scamp goes on his way rejoicing."

Proposes to compromise! Settles! Go to the courts! Only insist on making a court matter of it and the rascal will be found the more reluctant of the two. Here in Canada, the probability is that he would be led to the nearest brook, by a piece of his own clothes line, and thoroughly zoused. Even then he might thank his stars if allowed to escape the law courts. Evidently American farmers are too simple and guileless for the "land of the free and the home of the knave." They should move north.

Judging at Shows.

The English *Live Stock Journal*, in its last issue, strongly advocates a system of judging at agricultural shows, whereby the "champion" or highest prizes, may be awarded, not at the whim or caprice of a few jurors, but by the voice of the people. It says:—"What are called 'Champion' awards have always within the memory of man given rise to more dispute than any others; and this is natural enough when we consider that they involve the invidious task of selecting the best or nearest perfection from the very best of different breeds. We long ago arrived at a conclusion we have as yet seen no cause to modify, that in such cases at least there ought to be something very much like 'point-judging,' by which we mean

that, however managed, there should be a careful and discriminating calculation of merits and defects in detail, and the award not made, as most others, merely by a sort of general impression, or given to a specimen that merely "filled the eye," as it is called. Yet the very reverse of this has too often been the case, and the most difficult award of all hurried over, and often made by a portion only of the judges concerned. A rule recently passed in regard to the Champion awards of the Smithfield Club shows that at the very least need has been felt for ensuring greater care and deliberation; and some recent decisions in the poultry department, which have converted championships into a sorry jest, were only too completely accounted for by the curious revelation as to the *modus operandi* which burst upon the astonished poultry world a little while ago. More care and more time will, we may hope, obviate the most startling vagaries in such awards, however, and it was not to discuss this part of the subject we referred to them.

We have often had occasion to notice, especially when confronted by awards "no fellow could understand," the really remarkable unanimity of opinion on the part of the public. This is the strongest reply to people who account for inconsistencies and errors in judging by the plea that ideals vary and cannot be fixed; whereas we have not the slightest hesitation in saying that to all intents and purposes the ideal is fixed. The interested or skilled portion of the public know what they want in a prize-winner perfectly well, and, whatever a judge may do—we have repeatedly had occasion to observe it—will "spot" the exhibit that ought to have won with a precision and common consent that has often made us marvel. Very rarely, in case of alleged mistake, are different opinions ranged in anything like equal numbers; the preponderance one way or the other is pretty sure to be overwhelming, either for the judge or against him. The idea of recording popular sentiment in a prize seems feasible, if practicable, which we doubt. A much easier and simpler method of overcoming the difficulty, would in our estimation, be to discard premiums altogether, and let everything on exhibition, be it animate or inanimate, have its merits decided by the extent of business patronage it attracts on the grounds. For what, after all, are our agricultural shows but live business advertisements?

Domesticated Fish.

EDITOR CANADA FARMER:—The letter of "Piscator" in your March number, was, I think, timely and appropriate. The pike is, next, perhaps to the brook trout, one of our very finest fish, and merits all the good words "Piscator" has said in its favor. My present object in writing, however, is not so much to suggest ways and means of protection, as to urge farmers and others having suitable ponds on their estates, to introduce some approved species of fish into them. There can be no more interesting or ornamental pets about the place. You are surprised that I should term them pets? Well, allow me to explain. About ten years ago, whilst on a tour up through the northern part of the county of Waterloo, Ont., I remained for a few days in the neighborhood of a small village named West Montrose. While there I made the acquaintance of a well-to-do, warm-hearted Pennsylvania Dutchman, whose large farm and accompaniments bespoke the owner a man of more than ordinary taste. His milk-house, contiguous to the main dwelling, was erected over a brook, which communicated with a small pond about forty or fifty yards distant, and this latter was well stocked with fine, large specimens of brook trout;—splendid fellows some of them, over a foot in length. The milk-house was, of course, floored over, except an area of perhaps ten square yards, which had been reserved for the purpose of setting the pans, when necessary, in clear, cold water. My old friend, taking me in one morning, suggested a visit to his fish, or rather, as he termed it, from his fish—an idea which I had scarcely time to turn over in my mind, ere he commenced throwing bits of meat, bread, &c. into the water before us. In a minute or two a fine trout sailed majestically into the little area, followed by another and another, until, in less than a quarter of an hour, there would be probably twenty or more gamboling at our feet. Stooping down then gently, he gradually inserted his hand into the water, and gliding it along smoothly and slowly towards one of the largest of the lot, soon touched him. "Finny" was a little shy at first, but, after a moment or two of manoeuvring, stood his ground like a man, rubbed himself along and back against the extended hand, after the manner of a highly complacent cat that has just been admitted from the cold into a warm room. By degrees this familiarity increased; the others entered into the spirit of it, and

came also, each in turn, to pay their respects, swimming around the hand, nibbling the thumb and wrist, and gliding in and out in the most careless manner between his fingers. Reaching over to the largest fellow, after thus playing for a time, he began gently to stroke its side with the tips of his fingers, when, to my amazement, the fish turned over, exactly like a pig in the same circumstances, and evidently relished the performance as a rare and highly prized luxury, so much so indeed that when the hand was removed to a different portion of the water, "finny" followed it and showed as plainly as a fish can show anything, that a repetition of the game would prove in no wise objectionable. Finally, inverting his hand, palm uppermost, my friend held it thus about six inches under the surface, when one after another of the fish came and floated gracefully over it, hovering above it as if reluctant to leave, and, in most cases, settling down until their bodies rested upon it. In this way he caught and took up several, which we examined, without a single struggle on their part, and afterwards replacing them, let them go their way. I tried repeatedly afterwards to win their good graces by endeavoring to follow him in his manipulations, but no; they evidently detected the stranger, and showed by their continued evasion of me for days, that they possessed this instinct in a very high degree.

AMBO.

Black Bass and Pike.

EDITOR CANADA FARMER—Having inserted some remarks of mine in regard to our Canada pike, perhaps a few observations as to our next valuable sporting fish, may not be unacceptable.

The following are the characteristic marks of the Black Bass (*Grystes Nigricans*) of Agassiz: The color varies both as to the water in which it lives, the time of year, and especially at spawning time, when it is often so sooty dark even on the sides and belly, as to warrant its name, which generally, however, is a misnomer. Generally the color is dark olive green on the back, shading gradually into a brownish yellow on the side; belly opaque white. The body compressed, oval; the back arched; lateral line concurrent with back. The head is small comparatively, less than one-fourth the length of the body; the mouth large, and capable of great distension, as also the throat and gills. The eye is on a line between the nose and posterior angle of the opercle, five-eighths of an inch in diameter; the irides dark brown above, and pale yellow below. Nostrils small and double. The tongue itself is toothless, but both jaws are furnished with small needle like teeth thickly set together, and small points also on each side of the pharynx and bronchial arches. The bronchial rays are seven. The first dorsal fin is armed with ten stiff and sharp spines, the anterior ray shorter than the second dorsal, which has fifteen arched rays, with an obtuse spine half their length in front. The pectoral fins are, in the natural state, yellow, and have eighteen rays; the ventrals five branched rays. The anal fin has two sharp, and one longer obtuse spine, with twelve branched rays. The tail is only slightly forked and has eighteen rays.

There is a great diversity in black bass as to shape and weight. Those caught in ponds and lakes in the Counties of Brant and Oxford, to which localities the writer's experience is chiefly restricted, are much larger and thicker or "chunkier" (to use an Americanism) than those found, say, in the Grand River. Notwithstanding, where there are long, deep, still stretches of water formed by mill dams, as at Galt or Paris, bass are often taken averaging in weight those taken in lakes. The Pine Pond, on the south edge of the township of Blandford and Blenheim, Oxford, is, or was, a favorite fishing place for both black bass and pike. Here bass of three, four, and even six pounds weight are sometimes captured, the most alluring bait being a fresh, half-grown, green, or yellow frog. The bass here are remarkable for their thickness at the shoulders. So distinct is the figure and general configuration—especially as regards this latter quality—that we are inclined to believe the bass of Pine Pond and some other ponds to be nothing else than the "Oswego Bass" of our American sportsmen over the lines. However, as regards bass, the truth holds the same as to trout and other fish, the feeding ground alone produces remarkable changes in size, color, and general condition.

The dams on the Grand River, with one exception at Caledonia, are now, we believe, all provided with fish slides or ladders. The tributaries, as Smith's and Horner's Creeks, are also similarly fixed, at nearly all the mills along their courses, one of the most noted exceptions being Fry's

mill on Horner's Creek, which is about ten or twelve feet deep in perpendicular height. This latter is a famous resort for fish, the deep hole below the dam, about eighteen feet at the deepest, being up till lately, furnished with store of these fish. Owing, however, to their not being able to ascend any higher, the pike here are slaughtered in large quantities every season, both with rod and line, and by means of spears in spring when they come up from Pine Pond to deposit their spawn. Pike have been taken here weighing as high as ten and twelve pounds. There is good pike fishing also in the still water of the dam above, which flows in a sluggish, serpentine course, for about a mile and a half through the flats. Here, however, they are liable also to be slaughtered in vast numbers whenever the dam is let off for the purpose of being cleaned out, an event which occurs every third or fourth year. Had they free access over the dam, by means of a fish way, we know of no place in the County of Oxford which affords a better feeding ground and shelter than this, owing to the great quantity of logs in the bottom, and the reeds and weeds on the margin. The most favored bait used here is a green frog, but good takes are often secured with spoon hooks, although of these the pike—cunning as a fox—soon becomes well aware.

The season for fishing is approaching, and we may return to the subject of our fresh water denizens by alluding next to the "Pickerel" question. We will only add that the close season for Black Bass has been, on the whole, well arranged for their spawning instinct. Black Bass spawn naturally, that is when the state of the river as to size admits, according to our present law, from the 15th May to the 15th June. The natural instinct of the fish would make this limit in the Grand River even later than the 15th June; but we believe the short close times for bass, as well as for pickerel (which is one month later on the list) are as well regulated as could be in a country of such large extent as our Dominion.

Paris, Ont.

PISCATOR.

Education of Farmers' Sons.

EDITOR CANADA FARMER.—If farmers wish their sons to manage their farms in an intelligent manner, they must pay more attention to their education. Our public schools as hitherto managed, have done the farmers' sons more harm than good, as they cannot acquire in these schools such a sound English education as they require, owing, mainly, to the injudicious programme hitherto in force, and partly to the inefficiency of the third class teachers, so many of whom must of necessity be employed. Those teachers are not themselves well grounded in the usual branches, and they are not likely to teach others what they have not acquired themselves. I would therefore advise those farmers who can afford the expense to send their children to one of the denominational schools, or to private academies, where better teachers are generally employed, and of course better paid than they can be in the public schools. Boys who are intended for farmers, should learn to hold the plough as soon as they are strong enough to do so, say when they are about ten or twelve years of age, previous to which time they should be steadily at school, and afterwards attend school in the winter. They require education fully as much as those who are intended for professional life, but, of course it need not be carried so far. What is generally understood as a sound English education is sufficient to acquire at school. If they show particular talent for any mechanical calling, they might be specially trained for that. A boy may become a very good mechanic, and yet make a very indifferent farmer, because he has no particular taste for a country life. On the other hand many a man proves a failure in a profession, (to which he has been brought up, merely because some unwise parents consider a profession more genteel) who might have cut a good figure at a ploughing or reaping match. Some who have been very successful as business men in cities, have afterwards proved very successful as farmers, but in these cases, their early years were probably spent on a farm; and, with a natural taste for farming, they combine those habits of punctuality and close attention to whatever they undertake, which have made them successful men of business. To keep pace with the advancement of the times, scientific principles and practical farming must be combined, as neither science nor practice will produce the best results separately. Education is absolutely necessary to develop those innate faculties with which every one is actually endowed, and careful training on the part of both teachers and parents is necessary, to insure the development of those faculties in a right direction. A very common fault amongst many of our farmers is, that having had no education themselves, they cannot see the necessity of educating their children. I have heard of a farmer who, when he was a young man, used in the summer to go courting (sparking I believe is the usual term in Canada) barefooted, and with an old straw hat on his head, and when his sons were grown up he would have them follow his example; but that does not suit the ideas of the young hopefuls of the present age.

Nothing less than caliskin boots and fashionable hats will do now; and the plain clay pipes, which satisfied our fathers, must now be replaced by \$6 meerschaums. Many of our old farmers are too intent on hoarding their money, and instead of expending a fair proportion of their annual gains in improving their houses and surroundings, and allowing their sons proper time for recreation, they treat them worse than if they were hired men. So long as home is considered as a place only for eating, sleeping, and working, we need not wonder that boys are so ready to leave home as soon as they are able to earn their own living, and either hire out with other farmers, where they are better treated, or crowd into the cities, seeking employment for which by their previous occupations they are not qualified. A few may succeed after a struggle; but I fear most of them either leave for the United States, or become mentally and physically broken down, and sink into premature graves, whilst their ill-judging parents go on a idling field to field, or investing their money in bank stock and mortgages, which they can neither enjoy in this world nor take away with them to the next, but must leave them for their relations to quarrel over or perhaps go to law about after their death. And, as for their daughters, they are generally ready to catch at the first offer of marriage, however unsuitable it may be, and perhaps find that in their eagerness to leave their parental home, uncomfortable as it might have been, they have only fallen out of the frying pan into the fire.

SALAWAK

A Foul Butter Process in Scotland.

Oleomargarine, as an article of diet, is bad enough, but pales into comparative insignificance beside its co-relative process of renovating putrid butter, as practised in Leith and Glasgow. A firm, having establishments in both these cities, recently issued their annual circular, offering to reclaim old butter, however foul, and to return the same increased in weight, at a cost of \$1.87 per cwt., in casks. Reporters, personating customers, prepared for treatment a sample of the following deleterious mixture. A Cokeraine butt of grease butter, sold for lubricating purposes, was purchased, and there was incorporated with it a small quantity of Russian tallow, some of which had passed through the printing office machinery, and had absorbed particles of black-lead and mineral oxides from contact with the bearings of the shafting. A common tallow candle, from which the wick had been removed, was also added. The compound and the tallow candle were carefully melted into the grease butter; and notwithstanding the offensive character of these additions, the butter was decomposed as completely to disguise them. Thus prepared, the tirk was sent to the works, with a request that it be turned into "lumps of a bright yellow color for sale in the English market, and with a stubble-grass smell." The firm characterized the sample as very bad, but promised to do their best with it. In the course of a few days the butter was returned reconverted, its weight on return being 514 lbs. against 474 lbs. when sent for treatment. Were it not for some mineral particles discovered on strict examination, it would hardly have been possible to have identified the sample, so remarkable was the change in the whole composition. The statements are verified by the city analyst, who described the original butter as "in the last stage of rotteness, having a disgusting odor, covered with green mold and maggots."

It was found that the establishment was doing a large business and producing 3,920 lbs. daily, which was sold all over the entire kingdom. What the treatment consisted in is not explained. Oleomargarine at least was clean, and its ingredients, so far as our examination extended, were pure.

Irresponsible Tree Peelers

The Iowa State Horticultural Society, at a recent convention, voted tree peelers curses—never doing good but by mistake. The conclusion is somewhat plain and expressive, but embodies a truth that will be pretty widely appreciated and backed by many Canadian farmers. Few indeed of our agriculturists have not at one time or another been gulled by these smooth-tongued gentry who, fully equipped with dashing patent leather portfolios, books, and magnificent illustrations, travel from farm to farm at certain seasons like hungry Colorado bugs. We speak not now of the regular paid agents of responsible nurserymen within our own borders, the prosperity of whose businesses depends wholly upon the honesty of their dealings; but of tramps from the other side of the line, men who neither know nor care what the results may prove to the purchaser, provided they but effect their sale and pocket the proceeds. The disreputable lodges resorted to on such occasions are 'legion.' The person who takes the orders is rarely, if ever seen again. He does not deliver the goods—not he, and the party who does,

knows nothing at all about the first bargain. "Here," says he, "is your package; take it and pay for it, or leave it alone and be subjected to costs." Litigation in any form whatever, or even the prospects of it, are distasteful, so in ninety-nine cases out of a hundred, the package is taken, paid for, and a mental memento of the same treasured up for future guidance. A writer to the *Country Gentleman*, discussing this question, shrewdly remarks: "I have received such trees myself, and seen others do so, so dried and withered that there was not one chance in a hundred of their ever growing, even with the most careful treatment. After a nursery has had nearly every thing removed, the remainder is sold to parties at a low price, to be disposed of by peddlers. In this way worthless goods are sold at good prices. Should they ever come to bearing, there are many chances that they will not prove true to name."

Another dodge resorted to by these persons is to take one or two kinds—generally two—putting the price much higher than anything else on the list. With the aid of handsome illustrations of the fruit, they manage to sell a large or small order to nearly all on whom they call. They need not of necessity be new varieties. The average farmer is not supposed to be posted in such things. Should he be, a little bluff from the agent will quite often make him think himself mistaken, and he buys. Last year Foster's peach was one of the crack things of the list; 50 cts. each, or 25 for \$10. The majority invested \$10. I made inquiries for it at the nursery; they would let me have twenty live at 10 cts. each, but advised me not to take them, as they were not suited to our climate and inferior in quality to the popular varieties now in general cultivation.

This practice has been common ever since I became acquainted with the business. Something of a rare nature, "just suited to our wants," has been sold at a large price, which in our hands, has proved of no value. This process will, no doubt, go on for a long time. The majority of people desire to grow fruit, but are ignorant of the best way of making a beginning, and are in a good condition to be swindled. I do not think one in a hundred of the trees sold about here ever grow up and produce fruit satisfactory to the owners. It will be long before our soil will be well stocked with good fruit, if we are to depend on this method of growing it.

Indian Treatment of Meat and Skins.

In one of our American exchanges we find the following from a writer in Nebraska. He says:—When her lord kills a buffalo, the woman's work begins. She has to skin it, the meat to secure, and all to pack upon poles of poles, and carry to camp, where the meat must be cured. This is done by cutting it into thin sheets, and hanging it over poles in the hot sunshine, where it is soon dried thoroughly. Then it is packed fresh in packages of about one hundred pounds each, and enclosed in a nice tanning bark of thick buffalo skin, prepared especially for the purpose. This is not dressed down then after being fleshed, but well tanned, and of the full thickness of the skin; the hair side nicely ornamented with paint for the outside of the bark. This is sent like a huge envelope, so that the ends and sides will fold over whatever is put in them, and are secured by strong buckskin rings. By being thick it retains its form, and is very useful for carrying other things besides meat and tallow. After the meat has been taken care of, the skin must be looked after. Those taken at this season of the year are mostly dressed for lodges. They are first staked on a smooth spot of ground, and I write put on them, when they are ready for fleshing. This consists of removing the flesh with an instrument made of a straight bar of iron, about a foot in length, flattened at one end and filed to an edge. This being grasped in one hand, and a succession of quick blows given, the work slowly proceeds. The skin is then dried, after which the hair is removed in a dry state, and the skin reduced to the proper thickness by dressing down on the hair side. This is done with an instrument made by firmly fixing a flat piece of steel, filed to a beveled edge at one end, and with the corners rounded, to a large prong of a deer's horn. This is so trimmed, in connection with the body of the horn, as to form an elbow, and is used a little as a carpenter uses his adze. This work is usually done in the cool of the morning. The brains of the animal, having been properly taken care of for the purpose, are now soaked and squeezed by the hand until reduced to a paste, and applied to both sides of the skin, which is afterwards worked and rubbed until flexible. The preparation of robes is from winter skins, and differs from the foregoing only in being dressed down on the flesh side, so as to leave the wool and hair open the robe, and is more thoroughly worked, and secured by means of a sharp gritted stone.

Vivisection.

A letter recently addressed by the Baroness, Miss Burdett Coutts, to the London *Times*, remonstrating against the custom of dubbing game fowls, clipping dogs' ears and tails, and other similar practices common amongst exhibitors and fanciers, has led to a discussion in the English agricultural press, which is now conducted with considerable acrimony on both sides, and which latterly embraces within its range the more general and trenchant question of vivisection. The defendants strongly maintain their position, repudiate indignantly the charge of deliberate cruelty, preferred against them, and rather claim credit for their operations as "works of necessity and mercy." They practise torture? Perish the thought! Are they not rather the Howards, so to speak, of the stable and hen roost? "Game fowls" pleads one, "will fight under any circumstances; the combative quality is inherent in their very nature. What then can be more humane, kind, or considerate than to deprive them artificially, and once for all, of combats that must otherwise present only a source of annoyance and pain during their hostile lives." On similar grounds dogs are stripped of their ears and tails, in whole or in part, to obviate the prospect of these appendages being torn in the chase, though, for our lives, we cannot see wherein immediate danger in this respect threatens either, especially the tails. And, in like manner too, vivisectionists urge learnedly the claims of art, science and animal life, as the basis of their laudable manipulations.

If cruelty may be defined as the unnecessary infliction of pain or suffering, it is difficult to determine wherein the first mentioned class can evade the crime with which they are charged, for their highest aim—taking the most charitable view of it—is to improve appearances, and thus they do at a cost frequently of intense physical anguish to the subject. But whatever may be said for or against these comparatively minor operations, they pale into insignificance beside their more horrible counter parts in the vivisectionists' dissecting room. We would fain hope that the description given of one of these by Mr. James Corrie, of Kent, England, is the exception rather than the rule. Mr. Corrie had been in Paris, France, and whilst there, took the opportunity of visiting M. de Ador's Veterinary College. He says in the *North British Agriculturalist*:—"On presenting my card to the Principal, I was introduced to two of the students, who politely led me through the establishment. I observed nothing particular beyond what may be seen in our own Royal Veterinary College until I went into the dissecting room. I there saw two cases of vivisection on two horses, which shocked me very much. One of the poor creatures had just died under the torture of the knife. Its tormentors had commenced cutting into its trachea and oesophagus, nerves and blood vessels of the neck, down to the thorax and abdomen. The whole of the internal organs had been deliberately studied and experimented on, and before death had ensued the intestines had been literally turned inside out, and traces in confirmation were left which showed how hard the wretched creature had died."

The other unfortunate animal had for some hours been under torture, and was still breathing, and occasionally moaning most piteously. One of its eyes had been extracted from the socket, and dissected with the most delicate exactness. When I entered, the wretched brutes were in the last act of cutting and sawing the hoofs and feet in a variety of ways, for no other object that I could discern than to see what excruciations would make the creature wince most. Then leaving the feet in one shapeless mass of gore, two fellows commenced in the most wanton manner to apply red-hot irons to various parts of the body, making deep and fantastic shaped corusions. By this time the wretched animal was so much exhausted that, although now unbound by ropes it was unable to make any show of resistance. A snave came occasionally over its body, and it would now and then raise its head and look back woefully and wistfully to its tormentors. I was in hopes that I would soon see the last, and that death would cut short the frightful work of the manglers. But I was almost exultingly told that the *subject* was still sufficient for and endurance to allow time to external further scientific experiments. However, I could stand the screaming no longer, and I turned away with an amount of indignation and disgust which I had never previously felt, congratulating myself that the human operators were not Englishmen."

Now, sir, I am in a position to state that, whatever good may ultimately result to science from vivisection, none, or next to none, has hitherto been achieved. Permit me to say that I am a member of the Royal Veterinary College of Surgeons, was a member of Council, and an examiner for above twenty years on the Boards of London and Edinburgh, and in my official capacity, with necessarily ample means of information, I never discovered that a single practical result has been obtained either here or from across the channel by vivisection. Farther, I do not know of any discovery in pathology which the French school has made equal to those of the navicular disease, and unyielding for certain incurable diseases of the feet,

which we claim for two Englishmen; and the French have never assumed to themselves any superiority over our veterinarians in common or the most intricate operations. In every view of the case, I must therefore designate vivisection as a wanton, gratuitous act of cruelty, inflicting horrid tortures on a faithful, unoffending animal, and as tending to brutalize and demoralize young men on the threshold of professional life, whose destiny ought to be to alleviate pain and prolong the life of our most useful and favorite quadruped.—I am, &c.

A Dairy School in Denmark.

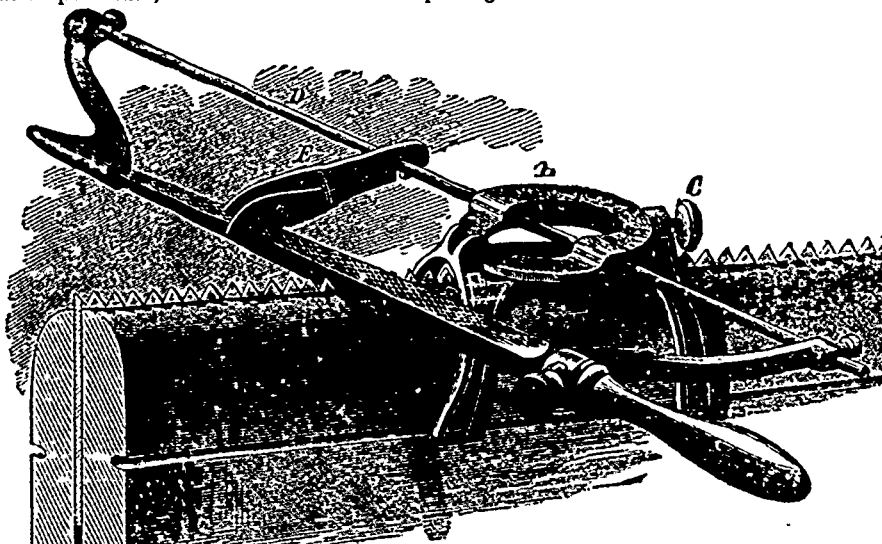
Institutions for imparting instruction in dairying have been in existence in Jutland and the Danish Islands for over ten years. In Denmark alone there are six, all prospering. One of these latter is thus described by a French traveller:—The school, says he, is situated in the island of Zealand, about twelve miles distant from the Taastrup station on the railway from Copenhagen to Coison. It is called the Thune Candburgs Skole (Agricultural School of Thune), and was founded in 1865, by Valentinas, one of the most distinguished Danish writers on husbandry. The director of the school, who is assisted by his wife and three professors, cultivates about 130 acres, keeps a herd of 20 cows, and bordering on the establishment is a farm, on which there are not less than 130 or 140 milch cows. Two sections of pupils are instructed. From the first of September to the first of November, the pupils are all girls; from the 15th of November to the first of August, the girls are replaced by boys. The girls pay about £2 per month, and are obliged to provide their own bed and personal linen, but receive board and lodging, light and washing, besides excellent professional instruction. At the time of my visit to this establishment, I found engaged in it sixty-two handsome and healthy-looking girls, all of whom had nice manners, and were, seemingly, comfortable and happy. The director assured me that they were all daughters of wealthy peasant-proprietors. The instruction given is theoretical as well as practical. The pupils, before being received into this establishment, must possess a good elementary education; their ages vary from fifteen to eighteen years. On entering the school, they are at first instructed in Scandinavian history, afterwards in arithmetic, book-keeping, natural history, the management of the dairy, physiology, and alimentation of cows. And through all, it is the object of the instructors to excite their pupils' curiosity, and fix their interest in agricultural matters. The book-keeping taught consists merely in the affairs of the dairy, and general housekeeping; not as sewing neglected, for in the afternoon the pupils are engaged in it; and, lastly, they are practised in singing by repeating religious and patriotic airs. The greater part of the morning is occupied in practical operations, and for this purpose the young girls are all in their turn employed at the different services of the dairy and housekeeping. Four batches of three girls receive a hundred quarts each of skim-milk, to transfer into cheese. Eight girls are employed at the churn, four preside at the butter washing, others are engaged milking the cows, washing the dairy utensils, preparing rennet, and in this way these girls are initiated into the various duties of the dairy. Some 400 or 500 quarts of milk are daily operated upon, every process being carefully noted and explained. The dairy is divided into five compartments.—1. The wash-house, fitted with two boilers for hot water, and a plentiful supply of cold water. 2. The compartment in which are placed the churn (worked by horse-power), the cheese press and scales for weighing milk, butter, or cheese, as taken in or given out. 3. The butter-cellar. 4. The compartment in which milk to be skimmed is placed. 5. The cheese store. The girls sleep in two large dormitories, and eat together in one long dining-hall. The school-room, like the other apartments, is large and cheerful, the walls being ornamented with maps and other instructive pictures. The boys, who succeed the girls, remain at the establishment from the 15th of November to the 1st of August following, and receive a much more developed education. These young men are all sons of well-to-do peasant-proprietors, and before being admitted to the dairy school are obliged to attend for at least one year at one of the high schools, after leaving the elementary one. In these high schools, founded by private individuals and societies, and encouraged by the State, the pupils receive excellent instruction in history, geography, geometry, modern languages, natural sciences, &c. &c. The dairy school at Thune receives each year forty of

these young men. They, however, have only two hours of practical work each day, during which time they are required to assist in all the various duties. The pupils are charged £1 12s. per month, exclusive of washing. There are laboratories and herbariums at the disposal of the pupils, and every week they make excursions into the country. Thus, when they leave the establishment, they have not only received a comprehensive and solid education, but have acquired a love for country life and agricultural pursuits. Norway and Sweden have also, for some years past, entered into this system, and have founded many establishments on the model of the one at Thune, besides bringing directors and professors from Denmark. Among these establishments may be mentioned the school of Haddop, founded five years ago, and that of Bergvara. Independent of these special schools, there are fourteen or fifteen model dairies recognized by the State and provincial governments, which are allowed to receive a few girls or boys, to instruct them in the manufacture of butter and cheese.

Improved Saw File Guide.

The annexed engraving represents a new apparatus, invented by Mr. H. Webb, Box 145 Yorkville, for guiding the file, during the operation of filing saw teeth, in such a manner that exactly the same pitch and bevel shall be imparted to each tooth. This is done by suitable indicating devices below described, which also admit, on the saw being refiled, of forming the teeth with the same pitch and bevel as in the beginning.

The saw is secured in a wooden clamp as shown, and held in a vise. The clamp has grooves on each side and



extending its entire length, these serving as guides for rods on the lower part of the frame or saddle, A. The latter may be freely moved along the grooves, and is by them maintained in uniform position as regards the saw.

The sliding frame holds a graduated circle, B, by means of lugs on one side and a set screw, C, on the other. The guide rod, D, passes through apertures in the circle as shown. It will be seen that the latter can be adjusted so that any mark on its periphery coincides with a fixed mark on the frame, and thus the file, which is connected with the guide rod, may be set so as to impart any desired bevel to the teeth, this being denoted by the graduations on the circle. The file is supported in the arms attached to the guide rod, its end being inserted in a hole in one end and a screw clamp holding it to the other. By loosening the screw, the file may be turned so as to give any desired pitch to the saw teeth. At E is an indicator of simple construction, which shows the pitch at which the file is set, and thus allows of easy resetting to the same inclination at any future time, as when using a new file or another corner of the same tool.

By some changes in a part of the device, this guide is made applicable to circular saws, in which case the guide rods, sliding in the grooves of the clamp, are made of proper curve.

The invention is quite simple; and we believe it will prove a very useful and handy implement for mechanics, since by its aid the not very easy operation of saw-filing is greatly simplified. In fact it is only necessary to set the guide at the proper pitch and bevel, and leave an apprentice or boy to do the manual work. For further particulars see advertisement elsewhere.

The Art of Cooking.

At the opening of one of the Government Schools for cookery in Leamington, England, Professor J. C. Buckmaster, F. C. S., delivered a most interesting inaugural lecture, in which we make a few extracts. He said.—“In sickness food will often do more than medicine. It is

not what we swallow that nourishes the body, but what we digest and convert into healthy blood, by which every part of the fearfully and wonderfully constructed fabric of the human body is daily sustained and nourished; and the true object of cookery is to make food more digestible. Physiologists tell us that the process of digestion begins in the mouth; it does, in fact, begin in our saucepans and stewpans. It is quite easy (and it is done daily in thousands of families) to make our food tougher, harder and more indigestible than if it had never been cooked. If a piece of meat be cut into small pieces, and thrown into a hot frying-pan, or into boiling water, every piece has its fibres hardened and its albumen coagulated, and the whole is converted into a hard indigestible mass, and this is the general way of preparing hashed mutton. When a piece of meat has been once cooked it can never be cooked again to advantage; it should be gradually warmed through in the stock gravy or sauce with which it is served; and the sauce or stock should be so delicately and nicely flavored as to make you quite oblivious to the remains of cold meat. In the same way when a piece of fresh beef is salted, the juices are drawn out, the fibres hardened, and the meat made tough and indigestible.

Two hundred years ago the potato was scarcely known in this country. In its raw state the tubers are not larger than a walnut, having a strong, acrid and poisonous taste. By cultivation and cooking the potato is converted into a very acceptable addition to our daily food. From this wild root we have obtained upwards of 150 varieties; and a failure in a potato crop is regarded as a national calamity. This vegetable, by itself, is not to be highly valued as food; it contains between 70 and 80 per cent. of water, 10 per cent. of starch, and only 2 per cent. of gluten. Let me teach you how to boil a potato. Go home and practise the boiling of a potato until you have done it as perfectly as possibly can be. Leave your saucepans and stewpans and go into the back lanes and teach the poor how to make the most of the food which God in His goodness has provided. This is the religion of common life. Always remember that the best part of the potato is nearest the skin. Select your potatoes all of the same sort, and as nearly as possible of the same size. They must be all of the same sort, because different varieties require different degrees of boiling; they should

be of the same size so as to be cooked in the same time. Thoroughly clean your potatoes by scrubbing them with a hard brush. A knife must never touch them, not even to remove the eyes. Pack them tightly in a saucepan so as to cover them with the smallest quantity of water. Always use clean rain water for cooking, if you can obtain it. Cover with water, adding a teaspoonful of salt to a quart of water. Bring them to the boil. Set them aside to simmer; potatoes are generally spoiled by quick boiling. Try them with a thin bone skewer. When nearly done finish the cooking by boiling up quickly for one or two minutes. Pour away all the water. Partly remove the lid to allow the moisture to evaporate. Give the saucepan one or two shakes. Lay a clean white cloth in a wooden bowl, peel the potatoes quickly, and send them to the table. This is the only proper way to boil potatoes. It would be much better if more attention were paid to the preparation and baking of bread. In our ignorant craze for white bread, we remove the lining membrane of the outer skin, which is rich in phosphates and nitrogen, because it gives the bread a dark color. White bread and fine flour must be regarded as luxurious rather than profitable.

Haricot beans are not much used, but for working men engaged in great physical exertion there is no cheaper or better food. They can be cooked in a variety of ways, and made savoury. It is a matter of little consequence whether the tissues are repaired with nitrogen obtained from vegetable or meat, but nothing can answer the purpose of a food unless nitrogen be one of its constituents. The gluten of wheat, barley, oats, rye, the casein of milk and cheese, the legumen of peas, beans, and lentils, are the vegetable sources of this nitrogen. I should have no fear of starvation because I was unable to obtain meat, for I know quite well that from oatmeal porridge and milk I can obtain all the conditions of a good food just as well as from the albumen and fibrin of beef and mutton. For centuries very little meat has been eaten in this country. The chief food of the Roman gladiator was barley bread and oil, because it gave him muscular strength. His rations were one pound and three-quarters of barley

meal, and four ounces of oil, and a pint of wine. The plain, simple food of our forefathers has been superseded by potatoes, white starch, bread and treacle, and sloppy tea. Tea is not food. You cannot nourish your bodies, nor properly nourish your children, on tea, and white bread and treacle, or butter. Among imperfectly nourished men and women there is always a craving for stimulants, and nothing seems to allay the sense of hunger so easily as warm tea or tobacco, or a dram. But no person will believe that these things perform the function of food, or can be used without a physical deterioration of the people, and a low physical condition is always associated with a low moral condition. The cookery schools which I am anxious to establish, are intended to teach the religion and happiness of domestic life. Cooking must be regarded as part of a great sanitary and social question. It has in every civilized country been regarded as the cardinal duty of domestic life, around which all the other duties and virtues crystallize. Some investigations and experiments which have extended over a long period of time have demonstrated that no man can remain in health unless his food contains a certain quantity of carbon to keep him warm, and a certain amount of nitrogen to repair the waste of his muscles, which are constantly wearing and wasting away. No laborer's wife will believe that a pennyworth of haricot beans or peas, with a halfpennyworth of milk or dripping, is a better food than threepennyworths of potatoes and a pennyworth of fat bacon. Mr. Buckmaster then alluded to the knowledge of cookery that exists in France as compared with England. The French, he said, were more careful. They had not such good food, but they made up their deficiency by better cooking. He was satisfied that all attempts to teach cooking with any satisfactory result to the wives of working men must end in failure. We must begin at the beginning, and make cookery a part of the national education of our girls.

Vegetation and Health.

Recent investigation, says the *Gardener's Magazine*, has proved that those adornments of our gardens, for the presence of which we so crave, are, as a rule, endowed with health-preserving qualities. Oxygen, when highly electrified and so rendered especially vitalizing, has in recent times been distinguished by the name of ozone. This is one of the chief elements of a healthy atmosphere. Now, centuries ago it was known that certain plants acted as powerful disinfectants. Thus Herodian tells us that, when in the second century the plague raged in Italy, the physicians recommended those who crowded into Rome to go to Laurentum, because there the sweet bay tree (*Laurus nobilis*) grew in great abundance, and the inhalation of air impregnated with its odors was a strong preservative against infection. And the disciples of Empedocles were wont to grow aromatic and balsamic herbs around their dwellings, from the belief that they were thus guarding themselves against fevers, agues, and such like. Has not too, among us, the tradition of its fever-dispelling power given the name of feverfew to one of the strongest-scented of the composite? Recent investigations, especially those of Professor Montegazza, of Padua, and Dr. Cornelius Fox, have shown that these old ideas were based on scientific truth. It is now ascertained that the quality of ozone is materially increased by exposure to the rays of the sun of various plants, among which the most common are the lavender, musk, cherry, laurel, clove, fennel, narcissus, heliotrope, hyacinth, and mignonette. It is interesting to know that the sunflower, which will grow almost any where, and could be turned to various useful purposes, is one of the most valuable of sanitary agents, since not only is it ozoniferous, but also destroys deleterious miasmata. It should be noted, as a further proof of the good influence of plant-culture on health, that while the manufacture of ozone is an independent work carried on by the flowers alone, the green leaves are performing their sanitary function by extracting carbonic acid gas from the atmosphere, and helping to preserve that proportion in its elements which makes it healthful. More remarkable perhaps, than all, is the eucalyptus, of which we have recently heard so much, and of which we shall soon know more. Thus the cultivation of flowers is a work not merely delightful and humanising in itself, but one which, in a way most beautiful and picturesque confers a positive benefit on society, so great that it can hardly be overated, especially in large towns, where there must necessarily be so much to poison and deteriorate the air we breathe. It may be added that the sunflower thrives even in the heart of London, and that it is readily propagated from seeds sown in March or April. It is nearly allied to the common Jerusalem artichoke, which also grows in the smokiest of districts.

Sheep-Killing Dogs.

A writer to the *Ohio Farmer* narrates his experience and its results as follows: For the last fifteen years I have not had a single sheep killed by dogs, although my sheep are generally a long distance from the house, often in a wood pasture and much exposed. In the first place

we put on three good-sized bells to the one hundred sheep, small bells will not answer. When sheep are killed by dogs, say nothing; skin them and let them lie in the same place. The first night after killing, the dogs will not come, but the second night they will be on hand. Cut four or five gashes in the fore shoulder of the dead sheep, put a small amount of first-class strychnine in the gashes, and next morning you will be sure to have them. Sometimes I have killed four dogs in one night. It is well to keep a shut mouth; put on the poison the second night after killing, about dark, for in fact it is against the law.

Any dog that will chase sheep when out alone, will sooner or later kill them. A green dog will sometimes kill a sheep in the daytime, but this seldom happens. Nearly all the sheep-killing by dogs is done in the night; they are very cunning about it, often going long distances from home when there are plenty of sheep close by.

Dogs kill sheep by tearing open the large veins of the neck and sucking the blood. When once they taste the blood they never can be broken of this trick. A single dog, sometimes kills sheep, but generally there are two—often a large and small dog. A sheep-killing dog will teach others. The first time a dog kills a sheep he will suck the blood, then eat some, and be satisfied. He soon learns to kill several, sucking the blood until he is full, eating no flesh the first night. Caution must be used. One morning I found a small yearling killed, with a small round hole eaten out of his fore shoulder. It puzzled me. I knew it was not a common dog. I told my neighbors to shut up their dogs. The second night after killing I put in the strychnine, and the next morning I had the largest red fox I ever saw.

Some six years ago three wolves came into Margaretta township, in this county. A large amount of money and time was spent in chasing them, but it took two years to kill them. They killed two or three hundred sheep. In a night they would kill ten or fifteen sheep; and they never would go near the dead sheep again, but kill some, two or three miles away. No dog would follow them. They were caught by sending west and getting some experienced hunter who finally succeeded in killing them.

Laying Shingles Correctly.

The *Practical Farmer* says: Not one-half the persons who lay shingles when making a roof on a building, have any correct ideas in regard to making a roof that will be absolutely "ram-tight" during a driving storm of rain. We have frequently seen men shingling, who, when they would meet with a worthless shingle, say one in laying two or three courses, would lay this poor shingle among the good ones, saying, "It is only one poor shingle—one shingle cannot make a poor roof!" But one poor shingle will make a leaky one. If first-rate shingles are employed, and one poor one is worked in among every 100, that roof might about as well have been without any shingles. If poor shingles are to be used, let them all be laid together near the upper part of the roof. The best of shingles will not make a tight roof, if they are not properly laid, while the same shingles would make an excellent roof if laid as shingles should be laid.

The correct rule for laying shingles of any length, in order to form a roof leak-tight, is to lay the courses less than one third the length of the shortest shingles. For example, when shingles are eighteen inches long, many of them will not be more than seventeen inches in length. Therefore, five inches is all that the courses will bear to be laid to the weather with the assurance of forming a good roof. The shingles must be three thicknesses over the entire roof. If they are not three thicknesses—if now and then a shingle lacks a quarter or half an inch of being long enough to make three thicknesses—there will, in all probability, be a leaky place in the roof at such points. Moreover, when the lower courses lack half an inch, or even a fourth of an inch, of extending up far enough to receive the rain from the outer-most course, in case the middle course were removed, it would be just as well to lay them seven or eight inches to the weather, as to lay them only five or five and a half inches. Many shingles are only sixteen inches long, and many that are sold for sixteen inches long will hardly measure fifteen inches. In this case, if the roof be rather flat—say about one-quarter pitch—four and a half inches is as far as they should be laid to the weather. In case a roof were quite steep, it might answer to lay the courses four and three-quarter inches to the weather.

When buildings are erected by the job, proprietors should give their personal attention to this subject, and see that jobbers do not lay the courses a half inch too far to the weather.

There is another important consideration which is too frequently overlooked in shingling, which is, "breaking joints." Careless workmen will often break joints within half an inch of each other. When the joints of the different courses come so close together the roof will most certainly leak. Why should it not? There is nothing to prevent it during a heavy rain. Unless a roof is steeper than a quarter pitch, much care should be taken to break joints not less than one and a quarter inches. Let all workmen and helpers be taught the vast importance of rejecting every poor shingle, except when the upper courses are being laid.

Sewage Milk Causing Typhoid Fever.

Death and disease proverbially lurk in the pot, and recently have been conveyed by what would generally have been considered as the most innocent, safe, and healthful article of food. At Eagorly, near Bolton, in Lancashire, a very serious and fatal outbreak of typhoid fever, which has laid more than two hundred people on beds of sickness, has recently occurred from the contamination of milk with sewage. It was at first believed that the direful consequences which followed the use of the milk in several dozen houses where it was consumed must depend upon some diseased state of the cows yielding it. They were said to have foot-and-mouth complaint, or something worse. Again, it was reported that they or the milk had imbibed some bad contamination. But as in the similar outbreaks of typhoid fever at Islington, Marylebone, Glasgow, Jarow, and elsewhere, the deadly poison has been demonstrated to have been derived not from any rare or exceptional source, but from sewage—alas! too potent and ubiquitous a poison to be so overlooked and tolerated as it generally is. The history of the Eagley typhoid cases is an almost literal repetition of the former sewage poisoning cases. At Hadman's farm, Eagley, the milk vessels were washed with water which Mr. Seigant, the Medical Officer of Health and Public Analyst, characterises as "very impure, contaminated, and totally unfit for drinking purposes; in fact, to be little better than average sewage."

Milk appears to have a special affinity for sewage matters; it has, indeed, a notorious capability of absorbing odorous or putrifying particles of all sorts; farmers know how rapidly it acquires the taste of even a few mouthfuls of turnips eaten by the cows; how rapidly it spoils in a close, ill-ventilated dairy. From the way in which traces of sewage water adhering to the milk tins have so often spread disease, milk must evidently have a special power of preserving in all their vitality the dangerous particles which it absorbs from sewage, from sick people handling it, or even living where it is kept. Such considerations point not only to a supervision of the dairy farms in town and country whence so much of the milk of the towns is derived, but also of the shops, rooms, and premises whence it is retained, and where, in a recent notable case in the west of Scotland, it is very apt to absorb and disseminate the poison of serious contagious disorders. Milk consumers, who already enjoy the protection of the law against the comparatively venal dilution of their supplies, may reasonably demand that they should have some guarantee that their children and invalids shall not be exposed to wholesale poisoning by contaminations which, as at Eagley, have caused two hundred and fifty cases of serious illness and about half a score of deaths.—*N. E. Agnew*.

The Dairy in Russia.

At the Dairy Fair held at Simcharville, Chautauqua County, New York, in October last, Alexis Elisheff, a young gentleman from Russia, read a paper giving some information concerning the progress of dairying in Russia. According to this writer, dairying among the peasants has been conducted in a very rude manner. For instance the peasant, he says, has a way of cooling milk with frogs. He keeps a number of small frogs in his dairy cellar for the purpose of putting into his milk. His idea is that these cold creatures will take the heat out of the milk, and so he puts them in to keep the milk sweet longer. Somewhat recently, however, the Government has established schools for educating persons in dairy management, and rapid progress is being made under their teaching.

Mr. Elisheff, on speaking on this point, says: "Our provincial governments have adopted a system of credit for helping the peasant. Whenever a neighborhood of peasants wish to build a cheese factory, they form a society, and ask for money to carry out their design. This money is lent on favorable terms. The factories are being operated quite successfully, netting about 1 cent. per lb. for milk. Again, our government have established a school for teaching the practical art of dairying upon the most improved methods that can be found in the world. For my own use, and for the use of this school, it is that I have

come among you to study your system of dairying. Two years ago a lady was sent to France to learn how to make the fancy brands of French cheese. Other agents have been sent to other countries of Europe for the same purpose, and information eminently valuable to Russia's dairying interest has been thus obtained. Sweden, Holland, England and the German States have been visited, and now in our dairy school the art of making nearly all of their fancy brands of dairy goods is being taught. The head school is near Iver, with branches being established at some points in European Russia. At this school butter and cheese making is taught in all its branches; also the care of stock, the construction of barns, and other dairy buildings."—*Rural New Yorker*.

Acclimation of Domestic Animals.

Horses, cattle, sheep, dogs and other domesticated animals, are no more exempt from the effects of a change of climate than is man himself. Hence in importing animals from abroad, or in exporting them to the South, it should be done in the autumn, after the malaria has been killed by one or two sharp frosts. In 1835 the writer moved with his servants from Maryland to Churchill, in Mississippi, taking care to arrive there in the Autumn after frost. He had with him some valuable cattle purchased from the then famous Short-horn herd of Mr. Betzhoover, of the Fountain Inn, Baltimore, intended for the Coles Creek plantation belonging to the late James C. Wilkins and Thomas Hall. The importation was looked upon by the old foggy planters of the neighborhood as a foolish venture, and the speedy death of all the animals predicted. But, acting on the advice of the late Wade Thompson, father of the present gallant general of that name, the bull and the three cows were carefully protected as well from the heavy dews as from the mid-day sun; the result was that they all became acclimated without difficulty, and in a few years the large herd of native cattle kept upon that immense estate was doubled or nearly trebled in value. In the five years that the writer lived in Mississippi, he had a great many dogs, chiefly hounds, sent to him from Maryland. The only dogs lost in the acclimating process were those which arrived out in the spring. So with dogs imported from England; those arriving in the spring have a severe and sudden ordeal to undergo in being transported from a comparatively mild and equable climate to the canicular summer heats of the North American continent. Make it a rule, where you have the choice of seasons, and wish to remove animals of whatever kind from one climate to another, to select for the purpose the months of October and November.—*Turf, Field and Farm*.

The Art of Carving.

It is worth learning, worth in fact the expenditure of a good deal of time and patience in order to its thorough mastery. When an affable but modest host has two or three times succeeded in landing the hissing turkey in his neighbour's lap, and the platter and gravy in his own, he will appreciate and strive to familiarize himself practically with the following regulations, laid down by the *Rural New Yorker*. We would merely suggest that his first experience takes place in a retired part of the house, where no curious quidnuncs are present to mar the solemnity of the occasion. The writer says:—It is not proper to stand in carving. The carving knife should be sharp and thin. To carve fowls (which should always be laid with the breast uppermost), place the lark in the breast, and take off the wings and legs without turning the fowl, then cut out the merry-thought, cut slices from the breast, take out the collar-bone, cut off the side pieces, and then cut the carcass in two; divide the joints in the leg of a turkey. In carving a sirloin, cut thin slices from the side next to you (it must be put on the dish with the tenderloin underneath), then turn it and cut from the tenderloin; help the guests to both kinds. In carving a leg of mutton or ham, begin by cutting across the middle of the bone; cut a tongue across and not lengthwise, and help from the middle part. Carve a fore quarter of lamb by separating the shoulder from the ribs, and then divide the ribs. To carve a fillet of veal, begin at the top and help to the dressing with each slice. In a breast of veal, separate the breast and brisket, and then cut them up, asking which part is preferred. In carving a pig, it is customary to divide it and take off the head before it comes to the table, as to many persons the head is revolting; cut off the limbs and divide the ribs. In carving venison, make a deep incision down to the bone to let out the juices, and then turn the broad end toward you, cutting deep in thin slices. For a saddle of venison, cut from the tail toward the other end, on each side, in thin slices. Warm plates are very necessary with venison and mutton, and in winter are desirable for all meats.

A Dog's Confidence.

Robert Hoy, Prebendary of Litchfield, Vicar of Belper, Derbyshire, sends the following description of the conduct of a bull terrier at Clay Cross to the *Animal World*: She was rejoicing over a litter of pups, attending to them with motherly care, caressing them, and showing for them much anxiety. The owner of this interesting family, accompanied by a few friends, came to look at them. The fierceness of the mother was at once developed, and manifested by impetuous growlings, snarls and barkings. She would evidently die in defense of her offspring. But the rector said, "I can take every one of those pups away from the mother, and she will not hurt me." He drew near and approached his hand toward one of the pups. The mother flew at it and seized it in her mouth. He did not attempt to withdraw it until she released it. He proceeded to lay hold of one of the pups. She seized his hand again and held it fast, but without biting it. By degrees he withdrew one of the little creatures. The same process was repeated until every pup was removed and the mother was bereft of all her offspring. She was the picture of misery. She looked up piteously in her master's face, and howled with an exceeding bitter cry. The appeal could not be resisted. He replaced the little ones in their nest, and rejoiced to witness the caresses and gratification of the mother. But his surprise and that of his friends was great when he saw her take them up, one by one, in her mouth, and bring and lay them down at his feet. He waited to see what she meant and was soon convinced that she wished to express her entire confidence in her master. She laid her dear ones at his feet, one by one, with the assurance that he would take care of them with affection equal to, if not greater, than her own. She then returned to her nest, now empty, lifted up her head into the air, and gave vent to several piteous cries, until her little ones were once more restored to her. It was impossible to misunderstand her impulse. She had at first misdoubted her master, but now she trusted him. She brought them of her own accord and placed them at his disposal, with full confidence in his love.

How House Air is Spoiled.

Hearth and Home gives some facts concerning the impure air of the home, which are worthy of attention.

The following facts will show how air in houses becomes contaminated.

1. An adult person consumes thirty-four grammes of oxygen per hour, a gramme being equal to fifteen grains.
2. A stearine candle consumes about one-half as much.
3. An adult gives off forty grammes per hour of carbonic acid. A child of fifty pounds weight gives off as much as an adult of 100 pounds weight.
4. A schoolroom filled with children will, if not well ventilated at the beginning of the hour, contain twenty-five parts in 1,000 carbonic acid, at the end of the first hour forty-one, and end of the second hour eighty-one.
5. The air is spoiled by the perspiration of the body and by the volatile oils given out through the skin. An adult gives off through the skin in twenty-four hours from 500 to 800 grammes of water mixed with various excrements, poisonous if breathed.
6. A stearine candle gives off per hour four-tenths cubic feet of carbonic acid and 0.03 pound of water.
7. Carbonic oxide is a much more dangerous gas than carbonic acid, and this obtains entrance to our rooms in many ways—through the cracks in stoves and defective stove pipes, or when the carbome acid of the air comes in contact with a very hot stove and is converted into a carbonic oxide. The dust of the air may, on a hot stove, be burnt to produce it; or it may flow out from gas-pipes when the gas is not perfectly consumed.
8. Another form of air injury is the dust of a fungus growth which fills the air in damp and warm places. We call it miasm from want of a true knowledge of its character.
9. Accidental vapors are the crowning source of air poisoning. These are tobacco smoke, kitchen vapors, wash-room vapors, and the like.

National Importance of Sheep Husbandry.

Mr. Chas. S. Lugin, editor of the *Colonial Farmer*, in a paper read at a recent agricultural convention in that Province, says that the census returns for the past thirty years show the average yield per acre of cultivated land in New Brunswick is actually decreasing! He then continues. "Sheep farming would stop this at once, and soon, by restoring the fertility of old farms, and at least 25 per cent. to the average yield per acre, more than enough to make up the deficiency in our agricultural productions. No question do I urge with more emphasis upon the farmers of New Brunswick, than that of sheep-farming. The home

demand is not nearly supplied, while the United States will take all we can send her, either sheep or wool. Last year Ontario and Quebec exported over \$800,000 worth of wool to the Republic, and nearly \$100,000 worth to England; while New Brunswick sent to the former country only some \$6,000 worth, and not a dollar's worth to the Mother Country. To be sure we sent her a couple of thousand dollars' worth of woollen goods, but this is nothing to what we could and ought to do. The old Swedish proverb that "sheep have golden feet," is worth laying to heart, and I believe that the farmers of New Brunswick will never realize their full tide of prosperity until, like Jason of old, they find the golden fleece, but not like him in a distant land, amid the noise of warfare, but on the quiet hillside of their own farms." Truths as applicable to Ontario as to New Brunswick.

Short-horn Sales.

The sale of Mr. Gilham's herd came off at Lincoln, Illinois, on the 15th ult. The attendance, owing to unfavorable weather, was poor. Of the cows sold:—

Imported Goady Two Shoes, brought.....	\$ 1,100
Goady Two Shoes 3rd.....	600
Wildflower's Duchess.....	400
Crema Tella.....	305
Wahwahenak.....	310
Hell Marion.....	550
Goady Two Shoes 4th.....	500
Wildflower's Duchess 2nd.....	320
Senora.....	300
Adelaide 3rd.....	250
Josie.....	250
Lalla Rookh.....	200

The cows averaged, including calves, about \$240 each. The following are the leading prices for bulls:—

Buckalew.....	230
Buckalew 2nd.....	230
Lord of Fitchburg.....	200
Duke of Scott.....	110
Third Duke of Exeter.....	150

The total proceeds of the sale were..... \$7,570

Mr. Wilson Wilson's Sale.

At this sale, conducted by Mr. Thornton, the following were the principal figures reached:—

Lady Ellen (old).....	51
Royal Charming 4th.....	115
Gazelle 27th.....	310
Daughter of Gazelle.....	100
Nouparol.....	115
Twenty-nine cows and heifers averaged \$74, and three bulls up wards of \$71 each	

Perth, Scotland.

At the annual sale of McDonald & Fraser, Perth, on the 8th ult., the following prices were realized:—

Stirling Rock.....	47
British Champion.....	02
Chilton.....	43
Baudmaster.....	46
Valentine.....	44
Valentine Hope.....	41
Sir John.....	55
John O'Groat I.....	49
Annandale II.....	60
His Lordship.....	53
Prince of Athole.....	104
Master Tree.....	38
Bank Note.....	50
Misc conception.....	65

Australia.

Mr. McCulloch's sale at Essendon, La Rosse, Australia, took place last month. Eleven bulls and fifty-seven cows and heifers were disposed of, the sum realised being £16,285, 10s. (\$31,427). The highest price paid for a bull was 650 guineas (\$2,730), and for a cow, 775 guineas (\$3,255). Roan Duchess sold for over \$5,000.

The Oakwood Herd.

At this sale which took place at Des Moines, Iowa:—

Lady Newham and calf, brought.....	\$920
Peachbud 11th.....	340
Emma Brock 2nd.....	350
Bloom of Oakwood.....	350
Pine Apple 6th.....	400
Nannie 6th.....	475
Cora 3rd.....	350
Nannie 2nd.....	500
Sallie Ann.....	375
Rosemary.....	340
Peri Constance Duke (bull).....	600

Mr. Collard's Herd.

The leading prices were "Oakwood Portulacca" \$245; "Besek Lass" \$200, and "Constance Duke of Airdrie" (Bull) \$650.

Mr. Briggs' Sale.

Seventy-three cows and heifers were disposed of at this sale for an aggregate sum of \$20,420, or an average of about \$280 each. The highest prices paid were:—

4th Louan of Oakhill.....	\$500
Eiva 3rd, and calf.....	600
Rosa Nell.....	605
Bonny Red Rose and calf.....	1,775
Louan of Oakhill.....	440
Maggie May.....	410
Belle and calf.....	450
Wair.....	420
Maurice's Baron of Oxford (Bull).....	690

Kidd's Sales for '75.

Capt. Kidd of Kentucky, publishes the list of sales conducted by him during the past year, from which it appears that he sold 1,063 Short-horns, 51 thoroughbreds and 584 trotters. General average for Short-horns £95; for thoroughbreds £117; highest average of any Short-horn sale £305 (B. B. Groom's); highest average of any thoroughbred sale £166 (Dale's).

West Liberty, Iowa.

The sale of Mr. Moller's herd took place here on the 4th inst; the bidding was keen and prices were fair. The following are among the highest:—

Heifers and Cows.

Emby III	875
Irma of Oakland	600
Melody Gaymire 7th	600
Ida	500
Addine	1,000
Adaline 2nd	1,100
Mary Emma	400
12th Loran of Claridon	575
Ross of Erin	450
Lama Bessie 3rd	300
Bright Mary 2nd	600
Mary Gem	400
Geneva Lass	675
Cornell of Kent	400

Bulls.

Byron Lyndale

Besides the above there were sold about 40, averaging \$25 per head. Considering everything, it was a very fair sale. The bulls sold low.

Coolac, Australia.

The "Australasian" brings reports of this great sale of the Messrs. Robertson Bros. Of bulls, the Duke of Alvie brought 500 guineas; Duke of Dermut, 850 guineas; Earl of Dermut, 925 guineas; October, 700 guineas; Duke of Rockingham, 600 guineas. Amongst the heifers, Roan Duchess was sold at 2,200 guineas; Countess of Brunswick 2nd, 1,200 guineas; Duchess of Rockingham, 1,050 guineas; Matilda 9th, 1,050 guineas. A few Hereford stud bulls also sold at figures ranging from 90 up to 200 guineas each.

MR. OUTHWAITE'S SALE AT BAINES.—The leading prices here were, Whitesocks, 200 guineas; Flower Girl, 105 guineas; Rosebud, 200 guineas; Lady Beaumont 6th and White Rose, each 170 guineas; Duchess of Chamburg, 120 guineas; Lady Danby, 125 guineas. A bull, Royal Windsor, was held in reserve at 5,000 guineas, but remained there, an offer of 4,000 guineas having been refused.

Stock Notes.

D. REFSOP, of Markham, Canada, lately sold a Shorthorn bull, Duke of Brockton, to Dr. Wm. Kenney, of Paris, Ky., got by Duke of Geneva, 7931, out of Duchess of Richmond, bred by Walcott & Campbell.

IT IS SAID that the first pure Devon cattle imported to America, of which there are any records, were six heifers and a bull, presented by Mr. Coke (afterwards the Earl of Leicester) to Robert Patterson, of Baltimore, in 1817.

MR. W. M. MILLER, Brougham, has received by steamer Prussian from Liverpool, two young Berkshire boars, bred by Heber Humfrey, Shriventham, Berkshire, which reached their destination in fine order within three weeks from the time of leaving home.

MR. WM. COLLUM of Haysville, has sold his Short horn bull President Grant (1955), by General Grant (296), out of Marchioness of Gloster 3d, of F. W. Stone's Margaret tribe, and the cow Rose and calf descended from imported Lily by Warden (1563), to James Maywood, Mornington, Ontario.

BIRTH OF A VALUABLE SHORT-HORN.—We hear with pleasure that Bright Empress, the beautiful four-year-old roan cow, for which Mr. T. C. Booth paid 2160 guineas at the Aylesby Sale last September—being the highest price yet paid for a cow or heifer in England—produced a splendid white heifer calf on Thursday last to Knight of the Shire (26552).

MR. JOSEPH VANCE of New Hamburg, sold his well-known Clydesdale stallion Clydesdale Jock 2d, by imported Clydesdale Jack, and out of a mare from imported stock, to Wm. Overman & Bro., Salem, Ind., for \$1,000 (gold). He has won the leading prizes in the counties of Waterloo, Oxford and Perth, during the past three years, and first prize and diploma at Guelph Central Fair, 1875. He is a dark bay 7 years old, and weighs 1,820 pounds, which is a good weight for a Canadian-bred Clydesdale.

PROFITABLE SHORT-HORN TRANSACTIONS.—Kirklevington Duchess 8th, bought from Mr. P. Davis, Gloucestershire, early last summer, at 400 guineas, and exported to America by Mr. B. B. Groom, Kentucky, was sold on the other side of the Atlantic lately, at 900 guineas, while 6th Duke of Kirklevington (30982), purchased by the same gentleman from Mr. Martin, Town End, Bardsea, at about 100 guineas and exported at the same time, has been sold in America at close on 1000 guineas.

Correspondence.

SAWDUST AS MANURE. Aden, Scarborough.—Sawdust of itself is not a manure. It is an excellent absorbent undoubtedly, when used as bedding; but whatever manurial influences it exerts even then, are due to the matters absorbed. Straw or leaves are much preferable.

SLIPPING BELTS. Mandon Bright.—Your threshing machine belt may slip from either of two causes. It may be too loose, or its inner rubbing surface may have been worn too smooth and hard. In the former case of course the remedy is to tighten it; in the latter, oil it well; this will soften it, and cause it to fit more closely the rougher surfaces of the pulleys. If you cannot oil it handily, wet it.

THE COMPOSITION OF EGGS. Laura.—The shell usually weighs about one-tenth of the entire egg. Its principle component is carbonate of lime. Estimating the weight of an ordinary egg at one thousand grains, the shell will weigh 100, the white 600, and the yolk 300. The composition of its contents is about as follows:—Water 74; Albumen 14; Fat 10 5; Ash (Salts) 1.5; Total 100.

THE APPLICATION OF CHLORIDE OF LIME. City Subscriber.—Chloride of Lime is simply lime charged with chlorine gas with which it combines easily and is set free by exposure to the air. When the space to be disinfected is large, the chloride may be dissolved in water and sprinkled when required, or cloths dipped in a weak solution of it may be hung up at intervals throughout the apartment. In the disinfection of putrifying substances, water-closets &c., it is applied directly and destroys the noxious exhalations as they are formed.

ROTATION OF CROPS. Farmer, Ottawa.—The system of rotation known as the five years course has, with judicious fertilizing, been found very successful. The lands under cultivation are allotted thus: twenty to thirty acres grass and clover, fifteen to twenty acres wheat, the same to oats, two to potatoes and three or four to other roots. The clover field will be mowed for two years, then ploughed and planted with potatoes, or wheat. In the fourth year, it will be devoted to some other general crop; in the fifth, sown and seeded, and the sixth will find it again a clover field.

SALTING CHEESE IN HOLLAND. Subscriber.—Cheeses are salted in Holland either by rubbing salt on their surfaces, and turning them over daily for from eight to fourteen days, according to size; or they are sunk to half their thickness in brine, made as strong as to swim an egg, and inverted in it daily. After salting, they are shelved for a few days to dry, then put in fresh water for a day or two, and finally, having been dried with a cloth, they are coated over with the milk of a newly calved cow, whey, butter or other greasy substance, which is overlaid with a thin coat of linseed oil, to exclude air and prevent cracks.

SUGAR FROM RAGS.—A Young Reader.—That sugar can be produced from rags is an undoubted fact. The process is a purely chemical one. If starch be boiled for some time in water which has been previously slightly soured by the addition of a very small portion (say 2 per cent) of sulphuric acid, the solution becomes perceptibly sweet. If, now, the acid be neutralized and removed, and the solution boiled down, it yields a syrup or sugar as may be desired. Paper, flax, and even saw-dust, treated in a somewhat similar manner produce like results, the sugar, in each instance, having the nature and properties of ordinary grape sugar.

RAIN-WATER AND SNOW WATER. Enquirer.—Rain water, from what source soever obtained, can never be absolutely pure. In its passage downward it absorbs oxygen, nitrogen, ammonia and other gases and becomes contaminated by contact with dust and other impurities, floating in the air. Under favorable circumstances, however, as for instance when collected off a clean roof, at the close of a protracted or heavy shower, it is perhaps the purest water there is. Melted snow at a certain stage excels rain-water in purity, but being incapable in transit, owing to its solid form, of absorbing atmospheric gases, it is necessarily insipid, until exposed for some time to the action of the air. When so exposed it gradually acquires the characteristics of rain-water.

FOWL MANURE. Fido, Teeswater.—Hen manure should be dried, thoroughly powdered, and sown broadcast, at the rate of from 300 lbs. per acre, upwards. Harrow it in well, being careful to prevent its coming directly in contact with the seeds or plants. It may likewise be beneficially composted with two or three times its bulk of road-dust, and applied like ordinary rich manure.

W. A. FARMER. Headingly, Manitoba.—It is impossible to name the sample of grass sent for identification, without seeing the flowers or seeds. We should judge it to be a species of *Calamagrostis* allied to the "Blue joint" (*Calamagrostis Canadensis*), which grows in low swampy places in various parts of the country. Please send us some seeds or flowers.

PULLING ON THE HALTER. X. Y. Z.—Having, as you say, "exhausted your wits and temper," calm yourself a little and try the following plan: Procure a stout rope or strap and a perfectly sound halter. Slip the rope under the horse's tail, crupper style; bring the ends along through the harness and hame rings and also through the side buckle or rings of the halter head. The object of passing the rope through the rings is simply to keep the former in place. Now tie both ends of your rope, exactly as you would an ordinary halter-strap, to the stall-ring or hitching-post. The slightest backward movement will produce a state of things in the rear that will speedily bring "Bob" to his senses. We have seen the plan tried when every other appliance had failed, and we have yet to learn of a single instance in which it did not effect a perfect cure.

A GOOD WHITEWASH. A. Dixon.—For outside work the following can scarcely be surpassed. Slack one peck of new white lime with boiling water, covering during the process to keep in as much of the steam as possible. Strain the liquid, and add to it half a peck of salt previously dissolved in hot water; one to one and a half pounds of rice paste, and half a pound of finely ground whiting. Add two and a half gallons of hot water; stir well and apply quite hot; half a pound of glue, dissolved and stirred in, will be a great improvement. For barns, and indeed any sort of buildings, and whether inside or outside, the foregoing is very superior. The only objectionable ingredient in the wash is the salt, which has the property, as everyone knows, of attracting sheep, cattle &c., causing no little annoyance, especially when at night the "belled critters" come prowling about. As the salt is not an essential ingredient, it were wise perhaps, in such instances, to omit it.

CLIPPING HORSES.—Old subscriber asks "Do you approve of clipping horses?"—We answer, emphatically, No. The practice ought to be as disreputable as it is vile. Whatever claims can be advanced on its behalf in other climes, the custom, in this country and latitude, cannot be too severely condemned. In this, as in most other matters, nature and common sense will be found to harmonize. A clipped horse is frequently the very best evidence of a lazy or incompetent groom. Feed well and otherwise properly attend to your horse and there is little danger of his coat bringing any discredit upon you. These remarks do not, of course apply to the question of trimming the fetlocks in wet and muddy weather. The latter is a good practice, and tends very naturally to prevent attacks of scratches and other ailments; but rise no higher with your shears, if you please.

TEACHING A PACER TO TROT. Backwoodsman.—Yes, we have seen the thing done and the process is an exceedingly simple one. The horse is made to stand in its natural "square" position. A surcingale, with a ring attached, is buckled round the body, pretty well back, the ring hanging below or about the spot to which the marlingale is usually attached. The one end of a stout leather strap is then buckled round the off, fore fetlock, the other end passed through the ring and attached in a similar manner to the nigh hind fetlock. A second strap is attached to the other feet in the same manner, the two straps crossing each other at the ring, which should be roomy enough to admit of the straps moving or sliding past each other freely. If the animal is now put in motion, it is evident that in order to advance either fore foot it must also move the corresponding hind one, or the one to which the former is coupled. The animal is usually very awkward at first and apparently overwhelmed with the discovery of its new powers, but as it gains confidence it speedily becomes more reckless, and we have seen some, at the end of twenty minutes training, dash round the ring, with, if not exactly the gait, at all events the full energy of a "Dexter."

Catalogues and Manuals Received.

AN INTERESTING MANUAL on the culture of strawberries and raspberries has reached us from E. P. Roe, New York. The work is exhaustive and valuable.

BAILEY & MUIR'S Short-horn Reporter for January and February, 1876, is full as usual, and contains a large amount of general information about stock.

PAUL BUTZ'S (New Castle, Penn.) descriptive catalogue has reached us. It is a good number, mostly devoted to hot-house, green-house, and bedding plants, evergreens and shrubs.

WE ARE indebted to Mr. E. W. Buswell, Treasurer, for "Transactions of the Massachusetts Horticultural Society" for 1875—a volume of over 200 pages of most useful and interesting information on the subjects of which it treats.

M. W. DUNHAM'S (Illinois) catalogue of Norman Percheron Horses in very nicely illustrated and well got up generally. It contains a history of this celebrated French horse.

THE ORANGE JUDD COMPANY issue a very interesting little book "An Egg Farm" on the management of poultry in large numbers, by H. H. Stoddard. It is neatly got up and valuable as a book of reference.

Patrons of Husbandry.

The following new Granges have been constituted since our last issue:—

412. WAINFLEET.—J. H. Overheld, Master, Marshville, Ont.; Charles Priestman, Secretary, Marshville.
 413. WILLIS CRAFT.—David Robb, Master, Willis Craft, Francis Graham, Secretary, Paisley.
 414. ALMA.—Henry Yercx, Master, Little Britain; John Connell, Secretary, Little Britain.
 415. STAR OF HOPE.—A. Marchell, Master, Ayt; Minnie Hullman, Secretary, Roseville.
 416. FAIRVIEW.—Abram Stevens, Master, Black Bank; Andrew Sirm, Secretary, Black Bank.
 417. LAVENDER.—Peter McHaffie, Master, Lavender, W. D. Anderson, Secretary, Lavender.
 418. WHEATLAND.—George Elliot, Master, Woodbridge; George F. Wallace, Secretary, Woodbridge.
 419. ERANOSA CENTRE.—Alexander McQueen, Master, Rockwood; D. McCaig, Secretary, Everton.
 420. QUINZE.—John A. Sjoener, Master, Redmersville; W. G. Stafford, Secretary, Redmersville.
 421. OWEN SOUND.—Wm. Meclauds, Jr., Master, Owen Sound, Alex. Bell, Secretary, Owen Sound.
 422. KILSYTH.—Wm. Brien, Master, Kilsyth; R. A. Stark, Secretary, Kilsyth.
 423. HONEYWOOD.—Wm. Tuplin, Master, Honeywood, D. C. Lamont, Secretary, Honeywood.
 424. STAR.—Edward Dawson, Master, Bowmanville; T. Smale, Secretary, Bowmanville.
 425. NIAGARA.—Alex. Servos, Master, Niagara; Wm. Shearer, Secretary, Niagara.
 426. SHETLAND.—Thomas Wilson, Master, Shetland; Thomas Bell, Secretary, Shetland.
 427. MCGILLIVRAY.—John Robinson, Master, Alisa Craig, William Wright, Secretary, West McGillivray.
 428. FARMERS' HOME.—D. McFarlane, Master, Kinlough; Jacob Nichols, Secretary, Kinlough.
 429. HURON.—John Smith, Master, Pine River; Wm. Montgomery, Secretary, Pine River.
 430. PINE RIVER.—George Blair, Master, Surgan; John Wilson, Secretary, Pine River.
 431. REACH.—John Tipp, Master, Port Perry; Albert Orchard, Secretary, Port Perry.
 432. ALTONA.—Hiram Kester, Master, Glasgow, A. D. Spears, Secretary, Altona.
 433. EARLTON.—John Buckingham, Master, Foversham; John Douglas, Secretary, Foversham.
 434. STAYNER.—John McColman, Master, Stayner; John Brown, Secretary, Stayner.
 435. IAVINE.—John Hunter, Master, Alma; Robert Cromar, Secretary, Selem.
 436. TORONTO.—John Holy, Master, Arlington, David Nichel, Secretary, Alliston.
 437. KINO.—James Bomiar, Master, Coventry; W. J. Peatson, Secretary, Lloydtown.
 438. CEDAR GROVE.—J. Durand, Master, Dorchester Station; G. Patterson, Secretary, Thirnesford.
 439. CLEAR CREEK.—Ellis Foster, Master, Port Royal; Ansley Becker, Secretary, Clear Creek.
 440. PORT ROWAN.—R. Richardson, Master, Port Rowan; William Franklin, Secretary, Port Rowan.
 441. VANATTER.—James Dowling, Master, Orangeville; Joseph Simpson, Secretary, Vanatter.
 442. WALDEMAR.—Robert Philp, Master, Waldemar; J. Lomas, Secretary, Waldemar.
 443. HORNINGS MILLS.—Robert McGhee, Master, Hornings Mills, John Polley, Secretary, Hornings Mills.
 444. TRUE BLUE.—Thomas Gallagher, Master, Perm P. O.; Thomas Hipprick, Secretary, Perm P. O.
 445. CORNWALL CENTRE.—George J. Dixon, Master, Milleroches; R. Milroy, Secretary, Milleroches.
 446. MILVERTON.—Henry Doering, Master, Milverton; Samuel Whaley, Secretary, Milverton.
 447. COLUMBUS.—Samuel Beall, Master, Columbus; James Burns, Secretary, Columbus.
 448. UNION.—F. Hathaway, Master, Union; James Davidson, Secretary, Union.
 449. PRINCE WILLIAM.—E. D. Estabrooks, Master, Lower Prince William, N.B.; Geo. Ingraham, Secretary, Lower Prince William, N.B.
 450. ASHWORTH.—William Thompson, Master, Uxbridge; J. D. Bagshaw, Secretary, Uxbridge.
 451. ZEPHYR.—L. Weller, Master, Zephyr; C. Weller, Secretary, Zephyr.
 452. WILFRID.—George Hart, Master, Wilfrid; S. R. Way, Secretary, Wilfrid.
 453. SOUTH ELDERALIE.—J. McIntyre, Master, Paisley; S. Ballachey, Secretary, Paisley.
 454. CHISLHURST.—Thomas Gilgan, Master, Chislhurst; James Connor, Secretary, Chislhurst.
 455. CARLTON.—T. W. Longstaff, Master, Woodstock, N.B.; H. B. Smith, Secretary, Woodstock, N.B.
 456. OAKLEIGH.—George Oliver, Master, Galt; A. J. Goodall, Secretary, Galt.
 457. ROB ROY.—William Bristow, Master, Rob Roy; George Bristow, Secretary, Rob Roy.

458. ARTEXSIA CENTRE.—George Briskin, Master, Floeherton; Wm. Wilcock, Secretary, Floeherton.

Division Granges.

27. HURON.—John Whitfield, Master, Grey, Ont.; Alex. Stewart, Secretary, Grey, Ont.
 28. NORFOLK.—Isaac Austin, Master, Port Dover; E. C. Carpenter, Secretary, Shilcoo.

Miscellaneous.

THE CANADA FARMER is one of the best monthlies among our exchanges, and merits, as we trust it receives, a large patronage.—*Rural New Yorker*.

THE SIGNATURES of "Sarawak" to an article on Hedges, and of "Publicola" to another on Parsnips, were inadvertently omitted in our last number.

A SMALL ITEM in our March number about the use of sunflower seeds for horse fodder, should have been credited to the *Essex Farmer*, not the *Maryland Farmer*.

THE FARMERS of Kentucky profess to prognosticate foul and fair weather from the breast bone of a yearling goose, — a striking instance of old geese pinning their faith to younger ones.

A SUBSCRIPTION of two thousand dollars has been guaranteed by the Ontario men towards their display at the Centennial, and a space of fourteen hundred feet has been reserved for their special use.

J. R. STUYVESANT has resigned his position as Secretary of the Ayrshire Breeders' Association, and is succeeded by J. D. W. French, of North Andover, Mass., to whom all communications in future should be addressed.

THE *American Agriculturist* illustrates in its last issue an appliance upon which to fasten fowls for "operating" purposes, *a la* dissecting tables. The best appliance of the kind we have ever known was a hot platter, and the best instrument a good sharp carving knife.

THE NEW YORK *Herald* claims the paternity of an article on "Shoeing Horses" which we last month credited to the *Livestock Journal*. The mistake lies not with us but with the *Journal*, for there it appeared in its proper department as original.

ANTIDOTE FOR PARIS GREEN.—Any one, says Prof. Riley, who uses Paris Green, should keep its antidote, the hydrated sesquioxide of iron, by him. A few spoonfuls, taken after even a bad case of poisoning with Paris Green or arsenic, is a perfect remedy.

THE FOREIGN DEAD MEAT SUPPLY OF BRITAIN.—Mr. Howard, a reliable English authority, states in a communication to the *North British Agriculturist*, that the proportion of dead meat received in Britain from abroad, is about 11 per cent. of all the meat consumed in the country.

THE PRICKLY COMFREY.—This new forage plant, the origin, nature, properties, and mode of cultivation of which, together with an illustration, were published in our volume for 1875, page 83, is, we are glad to learn, being introduced on this side the ocean. The results will be looked forward to with great interest. Certainly if the plant proves nearly as profitable as its advocates claim, it will be a great boon to farmers everywhere.

HORSE RACING.—The Newark (O.) *Banner* recently published the following item—a sad commentary on the way some fairs are run: "Our agricultural society is in debt about \$1,500, and can't pay its premiums and other expenses without borrowing money; but what of that? They built a big 'amphitheater,' had lots of horse races, and the Lord only knows how much whiskey was sold and drunk on the ground during the fair. Horse-racing and whisky won't win with farmers, generally."

THE AGRICULTURAL COLLEGE.—The scholastic term for the present year begins on the 18th inst. What the attendance is likely to be we have not yet heard, but, judging from the completeness of the staff and general arrangements, we should judge that a large number of students will avail themselves of the course. The curriculum embraces all the essential and accessory branches of agriculture, chemistry, tillage and cultivation, stock-breeding, veterinary surgery, English, &c., &c., and the theory thus taught will be supplemented by its practical application on the grounds.

BROOMS AND SWEEPINGS.—If brooms are wet in boiling suds once a week they will become very tough, will not cut the carpet, last much longer, and always sweep like a new broom. A very dusty carpet may be cleaned by setting a pail of cold water out by the door; wet the broom in it, knock it to get out all the drops, sweep a yard or so, then wash the broom again as before and sweep again, being careful to shake all the drops off the broom, and sweep far at a time. The water may need to be changed once or twice if the carpet is very dusty. Snow sprinkled over the carpet and swept off before it has time to melt and dissolve, is also nice for renovating a soiled carpet. Moistened Indian meal is used with good effect by some housekeepers.

THE VALUE of the peppermint crop in one county in Illinois this year, is estimated at \$500,000.

QUEEN VICTORIA sold last year \$15,000 worth of fat cattle, sheep and hogs from the Shaw farm, formerly owned by the Prince Consort.

THE AGRICULTURISTS of New Brunswick have formed a Provincial Farmers' League for the promotion of union, the extension of knowledge, and the better development of agricultural resources. R. L. McLeod has been elected President.

THE ANNUAL CONFERENCE of the District of Bedford Agricultural and Horticultural Association was held at Sweetsburg, Quebec, on the 15th and 16th ult., when practical addresses were delivered by Hon. H. A. Willard of Herkimer County, New York, Mr. Barnard of Quebec, the Chairman, Mr. Claves of Bedford, Mr. McEachran, Principal of the Montreal Veterinary College, and others.

THE PARIS MUSEUM is preparing an exhibition of models of various kinds of vegetables and fruits. The exhibition is to comprise 668 varieties of eating pears, 326 of cider apples, 243 of eating apples, 80 of nuts and walnuts, 65 of gooseberries, 60 of plums, 55 of strawberries, 50 of cherries, 38 of figs, and 18 of pears for making perry. There are to be 244 varieties of vegetables, including 76 of potatoes, 25 of pumpkins, 22 of turnips, 16 of radishes, and 15 of beet-root.

TO KEEP HAMS.—There is no better way to keep hams through the summer, free from taint or insects, than by hanging them up in the smokehouse, which is of course to be kept perfectly dark. Where there is no smokehouse or dark room, sew each ham up in a canvas bag and thoroughly whitewash it. We have also kept them perfectly by rubbing into them wood ashes, packing them in barrels and covering them with ashes.

SQUARE FEET IN AN ACRE.—The number of square feet in an acre is 43,560. In order to have this area the piece of land must be of such a length and breadth that the two multiplied together will produce the above number. Thus an acre of land might be 43,560 feet long by 1 foot broad; 21,780 feet long by 2 feet broad; 14,520 feet long by 3 feet broad; and so on. If the acre of land is to be exactly square, each side must be as nearly as possible 208 feet 5 1/2 inches. The nearest you can come to an exactly square acre with an even number of feet on the side is to make it 229 feet long by 198 broad.

TO CLEAR OLD PORK BARRELS.—Old pork barrels whether tainted or sweet, should be thoroughly cleansed before being used for new pork. A very simple and effectual method is to put in a peck of strong wood ashes and a couple of pails of water, and let it stand a day or two; then scour thoroughly with a stiff corn broom. The lye will take hold of all the greasy particles with which it comes in contact, and the ashes, water and broom will, if vigorously used, leave them as sweet as new barrels. Rinse in cold water to remove all the ashes, then pour boiling water all around the sides and wash clean; now rinse again in cold water and the work is done.

A TEST FOR SHEEP-WORRYING DOGS.—The report of the district veterinary surgeons in Wurtemberg for 1874, makes us acquainted with a novel device for discovering dogs which have been worrying sheep. In February of that year a dog attacked a flock of sheep during the night, and killed 11. The shepherd reported the circumstance to Veterinary Surgeon Osterstag, who soon discovered a dog which from its general appearance and muddy condition he suspected to be the culprit. He accordingly resolved to test his suspicions by giving it an emetic; the effect of which was to bring up some flesh and an ear, corresponding to that of one of the sheep which had been partially devoured. Another dog was suspected, and to this the same test was applied, but the creature only vomited potato food. In the law court to which this case was taken the owner of the first dog had to pay for the whole of the worried sheep.—*Veterinary Journal*.

SHARPENING EDGE TOOLS.—The grindstone should not be less than two feet or eighteen inches in diameter. It should revolve to meet the tool (except when grinding very fine or delicate tools). In grinding a chisel for instance, it should be held firmly on the stone without moving, until a slight wire edge is felt on the other side, which may easily be told by passing the thumb over the opposite side to that which is being ground. When this is felt, turn the chisel over and proceed in the same manner until the wire edge is transferred to the opposite side. It should now be whetted on an oilstone, taking care not to hold the tool too upright, or it will do more harm than good. It should be whetted first on one side, then on the other until the wire edge appears off; now take a piece of deal, free from grit, and draw the edge of the tool across the grain; if it has been properly whetted the wire edge will now be properly removed. Gouges are only ground on their convex surfaces. They should be ground until a wire edge can be felt by passing the finger along the inside of the gouge. This can be removed with the oilstone and deal. While grinding gouges they should be constantly turned from right to left, or the edge will be full of notches. Tools for soft wood should have a long bevel edge to make them cut keen. About a half-inch bevel is best.—*American Cabinet-Maker*.

To CLEAN METALLIC ARTICLES.—Gilt metallic articles may be cleaned by rubbing them very gently with a soft sponge or brush, dipped in a solution of half an ounce of potash, or one ounce of soda; or, still better, of half an ounce of borax, in sixteen ounces of water, and drying with a soft linen rag.

THE IDEA THAT the number of acres in crops indicates the farmer's income must be abandoned, and the number of bushels per acre must be looked for instead. There is certainly less profit in ploughing fifty acres, to raise one thousand bushels of grain, than in ploughing but twenty-five to grow the same amount, and trusting to good seasons for fair crops will not be thought of by the improved farmer.

FATAL DISTEMPER AMONG DOGS.—The Hamilton Times says: A well known dog fancier informs us that a distemper resembling the epizootic is committing ravages among dogs in this city, and that some very valuable animals have died. He himself has buried four thoroughbred imported setters, thus sustaining considerable loss.

SINCE the article on "Vivisection" in another column was in type, the report of a Royal Commission on the subject has reached us, and shows that the practice is, on the whole to be discontinued. To the question whether the practice of subjecting living animals to experiment can be altogether prohibited, the Commissioners reply in the negative, on the ground that prohibition would either produce secret evasion of the law, or else drive English investigators and students to foreign countries; and further, that on the testimony of the most eminent authorities the results of the experiments are so important, and are so beneficial both to man and animals, that the utility far outweighs the evils which attend them.

THE LETTER of "Amateur," St John, New Brunswick, which, with the accompanying communication about drainage, is published in another column, demands a remark or two. If the idea intended to be conveyed is the practicability of drainage, we very much fear that the figures quoted will have a contrary effect. That the result was a profit in the special case instanced may be quite true. The crops raised, however, were special ones too, and came more within the sphere of the market gardener than that of the general farmer. The figures are in fact far too high to furnish anything like reliable criteria of the cost of general farming. The wages paid, \$2.50 per day, are high. The depth of drain, 4 ft., is very rarely advisable. The distance between drains, only 24 ft., is quite unusual; and the tiles used, 3 inch, are considerably larger than those generally employed for similar purposes.

DIGESTION.—The Sanitary Record says: 1. Food for the supply of the daily wants of the system is most rapidly and thoroughly digested when taken early in the day, etc the nervous and secretory forces are exhausted by toil. 2. Rapid digestion in the early part of the day contributes to the immediate demands of motion and innervation. 3. Food for the repair of the continuous wear and tear of the tissues is in less immediate request; the completeness of its solutions is of more importance than the rapidity, and it is best taken toward the evening, when an opportunity is afforded for its leisurely absorption during sleep. 4. The duration of digestion bears a proportion to the quantity of food eaten. 5. In youth the digestion is quicker and the stomach sooner emptied than in grown-up persons. 6. Rest before meals makes the digestion more complete. Exertion immediately before meals retards digestion, and exertion immediately afterwards deranges it. 7. Sleep retards digestion, but makes it more complete. 8. Alcohol retards digestion and renders it also incomplete. 9. Earnest pre-occupation of mind retards digestion, and may even quite annul it. 10. Water quickens digestion, and encourages the absorption of fatty and saccharine matters, but its effect on the complete solution of albumen is doubtful.

IT IS NOT UNCOMMON to find some cats suckle the young of other animals. Indeed, we know an instance of a bitch and cat exchanging their produce, and bestowing maternal affection on each other's young. But in this case there was no disparity in size between the mothers. In the Central Park Museum, New York, are two young lion cubs nursed by a terrier. They are four or five weeks old, a pair, lion and lioness, fine healthy little creatures, and are nearly old enough to be shewn to the public. They are the progeny of the pair of beasts known as Lincoln and Jenny in the Museum. But the mother being from some cause unable to nurse them, they were at once given to a large terrier whose puppies were taken away, and who plays the part of a foster-mother. She seems, indeed, as fond of the cubs as if they were her own offspring, and covers them with caresses, though they are really as big as she is. It is a curious fact, says the Scientific American, "that lions reared in captivity are not as gentle as those captured and tamed. The parents of these cubs, which were caught when wild and tamed, are very tractable, while some of the other lions which were born and brought up in the Museum are sullen and ferocious."

COOKING BY COLD.—It is a curious fact, not generally known, that the action of intense cold on organic substances is similar to that of a high degree of heat, and that, when subjected to a very low temperature, meat can be brought to a condition similar to its state when cooked by actual warmth. Quite recently a Hungarian chemist Dr. von Sawiczewsky, who, it appears, has investigated all the various ways suggested for preserving meat (by chemicals, cooking by heat and hermetically sealing, etc.) and has found points of objection to all, has attempted the preparation of the material by subjecting it in a perfectly fresh state to a temperature of 33 degrees below zero, Fahr., and sealing it afterwards in tins. The results obtained have been highly satisfactory; the meat on being removed from the cans appears, in point of smell and color, as fresh as it just taken from the butcher's stall. Although partially cooked, and thus requiring less fuel to complete its preparation for the table, it is entirely without the taste of meat which has been partially subjected to any heating process, and may be roasted, boiled, or otherwise treated, the same as if it were fresh. A commission appointed by the German Government has lately conducted a series of careful and successful experiments upon the process; and as a final test two convettes of the German navy, being about to circumnavigate the globe, have been supplied with a large stock. An extensive factory is being erected in Hungary for its manufacture.

Letter from Rev. John McMurray. JAMES I. FELLOWS, Esq. Dear Sir: I have recently heard from an invalid of the great benefit derived from your Compound Syrup of Hypophosphites, and having in many other instances marked the most beneficial results from its use, I cannot but regard its discovery as a matter of devout thankfulness to a benign Providence. I have used it considerably myself, and, at intervals during several years past given it to some members of my family. I have also recommended it to others, and invariably found it to be of essential benefit in those complaints for which it is especially recommended. In bronchial and other chest affections, in arresting impendent consumption, and in lessening the distressing symptoms of this disease in its hopeless stages, as well as in cases of nervous debility, in giving tone to the system, it is undoubtedly a valuable remedy. I am, dear sir, yours truly, JOHN McMURRAY, Methodist Minister Newport, N.S.

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 flavored beverage which may save us many heavy doctor's 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."—Civil Service Gazette. Made simply with boiling water or milk.—Each packet is labelled—"JAMES EPPS & Co., Homoeopathic Chemists, 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., Homoeopathic Chemists, and manufacturers of dietetic articles, at their works in the Euston Road, London.—See article in Cassell's Household Guide.

A WATER-PROOF PAINT.—Hydraulic cement mixed with oil is recommended as a paint for concrete brick walls. The same is a good water-proof paint for roofs and walls of cisterns.

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