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THE CANADA FARMER.

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The Field.

Growing Barley Many Years in Succession.

In last month's CANADA FARMER we wrote upon the culture of barley, and the reasons why that grain should be a still more important crop to our farmers than it now is. As we write, no reliable tidings have reached us of the state of the winter wheat, but judging from such scattered items of information as we have been able to glean, it does not seem probable that that grain has suffered so much as to seriously influence prices. We have therefore before us, and shall have, unless some improbable, widespread disaster should occur to the growing wheat, a likelihood that wheat will not reach a figure high enough to make its growth the most profitable way in which the farmer can expend his time and labor. This will doubtless cause many farmers to sow barley where spring wheat would have been sown. To such farmers, a few particulars of late experiments by the celebrated English farmer, J. B. Lawes, of Rothamsted, will be valuable. He has grown barley by the aid of artificial manures, on the same land for many years in succession.

The first experimental barley crop was in 1852; and the land has been under barley ever since. Thus, in 27 years, there have been grown one crop of clover, one of wheat, and 25 of barley; the last 23 of which have been under careful experiment. Excepting on one plot, no dung or animal manure of any kind, has been applied to the land during the whole of that period. To one plot of land there was applied, per acre, superphosphate of lime alone; this plot gave an average crop for the 23 years, of 24½ bushels per acre. To the second plot were applied, per acre, superphosphate and 200 pounds of ammonia-salts (or 275 pounds of nitrate of soda, which contains the same quantity of nitrogen); this plot yielded 49 bushels per acre. To the third plot was applied, per acre, the same as to the second plot, and, in addition, sulphates of potass, soda and magnesia; the plot yielded 48½ bushels. The fourth plot received, per acre, fourteen tons of farm-yard manure, and it yielded 48½ bushels per acre.

Mr. Lawes points out the striking fact that small quantities of artificial manure should give, over so long a period, as much barley as fourteen tons of farm-yard manure, and he then explains points of distinction and similarity between the two kinds of fertilizers, thus:—

In round numbers there have been removed annually, in corn and in straw, about 2½ tons of produce per acre. Deducting from this the moisture it contains, there remain about 46½ cwts., or rather more than 2½ tons of dry or solid substance removed annually; and deducting from this again the mineral matter and nitrogen it contains, there remain about 44 cwts. of non-nitrogenous vegetable, or combustible substance. In the dung very much more than this amount of vegetable matter has been returned to the land every year, but in the artificial manure none. Here, then, we have two parallel experiments, extending over a period of twenty-three years, in one of which much more than the total amount of non-nitrogenous or carbonaceous organic matter than was contained in the crop, has been annually returned to the land, and in the other none, and yet the produce is equal in the two cases.

Now, I would ask, whether you think it possible that such a soil as mine could stand such a drain as this for twenty-three years—or for twenty-seven, if we go back to the last application of dung—without showing a marked decline in the produce, if the plant depended upon the supplies of non-nitrogenous vegetable matter within the soil, or if that contained in the dung was at all essential to the result. The conclusion is, I think, obvious, that under the influence of the superphosphate of lime and ammonia-salts or nitrate of soda, the growing barley was able to obtain its non-nitrogenous organic matter, amounting to more than 90 per cent. of its total dry or solid substance, from the atmosphere, and not from the soil.

You will not fail to see the great importance of recognizing this fact, when you are told that you may depend upon artificial manures to grow more frequent corn crops.

Artificial manures contain but little, and the best of them no carbonaceous organic matter. If, therefore, they were active only so long as the plant could obtain sufficient organic matter from the soil, each succeeding corn crop would cause a reduction of the condition of the soil, which could only be restored by the dung-cart. If, on the other hand, the organic matter is supplied by the atmosphere, the repetition of corn crops by means of proper artificial manures may increase, rather than diminish the condition of the land.

If we deduct from the 14 tons of dung its water, its carbonaceous organic matter, and the extraneous mineral matter (soil, sand, &c.) which it always contains, there remains scarcely half a ton of mineral and nitrogenous matter. A good deal of this mineral matter is comparatively worthless. Of nitrogen there is about four times as much as in the 200 lbs. ammonia-salts, or in the 275 lbs. of nitrate of soda. But as the artificial manure and the dung have given equal crops, it is obvious that a given amount of nitrogen applied in the artificial manure is much more effective than the same amount supplied in dung.

There is one essential mineral constituent of a barley crop which is supplied in dung, but not in the mixture of superphosphate of lime and ammonia-salts or nitrate of soda. This is potass. The crops grown by this artificial manure must, therefore, have obtained it from the soil itself. Of potass, the average crop of corn and straw has removed from 30 to 35 lbs. annually. It is obvious that, up to the present time, my soil has been capable of yielding the quantity required.

The dung has supplied about 1½ cwt. of potass annually or about 3½ cwts. in the twenty-three years; and in the experiment No. 3 the sulphate of potass has supplied an average of about 1 cwt. annually, or about 23 cwts. in the twenty-three years. Yet neither the dung, nor the artificial manure containing potass, has given more barley than experiment No. 2 without potass. What may be the resources of other soils in potass it is not for me to say. It is, however, not at all likely that any farmer will grow corn and remove both the straw and the grain, for so many years in succession from the same field as in my experiments, without bringing the dung-cart into it; and I may remark that if the straw had been returned to the land, I might have taken more than fifty crops of barley in succession, without taking from the soil as much potass as I have done up to the present time.

The same kind of argument is applicable, but in a higher degree, in the case of silica. The straw of a barley crop contains about five times as much silica as the grain, so that if the straw were periodically returned to the land in the form of dung, the exhaustion of that substance would be more gradual than that of potass. So also with other constituents.

Mr. Lawes then shows by tabular statements that the quality of his barley steadily increased during the time the experiments were being carried on. For the first eight years it averaged 51 pounds per bushel; for the second eight years, 54½ pounds per bushel; and for the third seven years 55½ pounds per bushel. It is probable that the increase is in great part due to more favorable ripening seasons during the later years. But whatever may be the cause, it is clearly shown that when barley is grown by proper artificial manures, even for many years in succession on the same land, it does not deteriorate in quality. The barley grown by superphosphate alone showed a marked decline during the last half of the 23 years. That grown with the other applications produced more during the latter than the first half of the period.

Corn.

Saving Seed, Breaking ground, Cultivation, &c.

EDITOR CANADA FARMER:—On a recent tour through the Dominion, I noted, among other things, the scarcity of what ought to be one of our most important crops, namely Indian corn, and I want to make a few remarks about the possibility of its profitable culture in the Dominion, and I will commence with a few hints about securing the seed.

It has been, for some years past, my custom to secure my seed with the greatest care, for without reliable seed no satisfactory results can be obtained. This is my way of securing it:—Go into a field of desirable corn just when the husks on the earliest ears are beginning to turn yellow. These, as a general thing, will be the largest and most per-

fect ears. With a knife, sever the ear with all the husk from the stalk.

The next important thing to having good seed, is to have it saved in good condition until wanted for planting. This is done by stripping back only enough of the husk with which to hang the ear, leaving the remainder in its natural position on the ear. Hang the corn in some dry loft, as in the woodhouse, or at the top of the barn. Some persons will say, in the loft of the corn crib, over the corn is just the place for that. But, not so, that is one of the worst places in which to attempt to save the seed and expect it to retain its vitality, which vitality is, of course, essential to its germination. The corn-crib is a bad place, for the reason that it is just where it will receive the steam and gases from the sweating corn beneath, which are injurious to the seed. Many have noticed, in taking seed corn from the top of the pile in the crib, that it would not grow, but on digging down into the same, seed was obtained that would germinate more satisfactorily. But noxious gases are not all that is to be guarded against. A rat and mouse-proof position is very desirable, and that is obtained by attaching wires of a suitable size to the rafters or other convenient support for the corn. To these wires are suspended in a horizontal position, two poles of proper size and of any desirable length. On these are placed smaller poles, on which the ears of corn are hung in twos, by tying two together and hanging them across these last-mentioned poles, taking care always that the whole structure is far enough from all parts of the building, and connected only by the wires, so that rats and mice can not jump to it. By doing this the seed-corn is safe so far as location and security against rats and mice are concerned.

It is advisable thus to secure a great deal more of the corn than will probably be wanted. As it must be assorted, and only the very best taken for seed—it will be but a small proportion of all that was saved; but all that which may be rejected as seed, is good stock to have on hand. All sound corn thus treated is of the best quality for domestic use, for homing and family meal, for the reason that corn, thus treated, retains the sweetness and moisture so characteristic of new corn. But let good seed and plenty of it be the main object, as the neighbors will want some, especially when they come to understand with what care and judgment it has been saved.

A neighbor of mine, and a practical farmer, said to me on a certain occasion, when he became aware that his crop was a failure on account of bad seed:—"Such seed as you planted would have been cheap to me at twenty dollars a bushel, for I depended on bad seed and failed of a crop, whereas good seed would have made a good crop."

On breaking the ground, if flat or level, it should be laid off in lands twenty-eight feet wide, which will give seven rows four feet apart, but, if sufficiently rolling to need no surface-drains, should be ploughed in one piece by throwing the furrow slice first outward and then inward at every alternate ploughing. If soil, it should be ploughed not to exceed three inches in depth and be thoroughly cultivated and pulverized before planting, by harrowing four to six times. This will thoroughly pulverize the surface and place the plant-food used by the corn in the most available position.

This theory of shallow ploughing is not a very popular one, I know, but, in support of it, I will give a case or two and some reasons why I think it the best mode. There is a case on record of the Washington Co., N. Y., Agricultural Society, who appointed a committee to examine a crop of corn raised by J. W. Dickey, of West Alexander. The committee report one hundred and fifty-five bushels per acre. Ground, an old soil broken two and a half to three inches deep, well turned over and harrowed six times before planting, and cultivated five times after. A case in my own experience:—In 1860, I cleared off a piece of thirteen acres of new ground. I hired some of it ploughed, and I got, as I thought, a very poor job, very shallow, and "cut

and covered," as we say. The rest of the piece I had ploughed with my own team to a good depth and well turned over. The corn on that part which was poorly ploughed, showed the best all through the season, and turned out more and better corn than the other.

Stalk or stubble ground should be ploughed deeper.

The reason for so much and thorough surface culture is, that the roots of the corn obtain their nourishment from near the surface, and do not strike deep into the soil. For this reason, do not cultivate deeply after the roots have made much of a start, else they will be broken and injury be done to the corn, but let the subsequent culture be principally with the harrow and cultivator, leaving the ground as nearly level as possible; having an eye to proper drainage by cultivating the last time across the lands and opening out the land furrows.

To recapitulate:—Seed procured as per the foregoing germinates with more certainty, grows more vigorously, tends to ripen earlier, and improves in quality. To prove which, I may mention that I have had for sixteen years, a variety that, at the beginning, was so large and late, that but a small portion of it would ripen. Now, it is of good size, very firm on the cob, weighing well and early enough for any season we have had since I got it acclimated.

I would not advise the culture of corn on a large scale, in sections of country where its success is doubtful, but try some, by all means, as an experiment; for it is by striking out into new fields of enterprise, that some of the most valued acquisitions to art and science have been brought about.

Don't be confined to old and tried varieties, but retain them as fixed facts, and ever be on the alert for something new and equally reliable with a possibility of improving on the old. If the best of results are not experienced, and the highest expectations reached the first season, don't be discouraged but try on, remembering that none, or very few of the cultivated varieties of grain, fruit, vegetables or flowers, which now reward the labor and make glad the heart of the husbandman, were naturally so valuable. They have been brought to their present state by judicious cultivation.

In the future, when sufficient time has elapsed to demonstrate the foregoing by actual planting and harvesting, those who act upon these suggestions will be doing me, and probably others, a pleasure, by publishing their experience.

Pleasant Plain, Warren Co., Ohio.

WM. FERRIS.

Sorrel.

EDITOR CANADA FARMER:—In looking over the February FARMER, I noticed a paragraph about the cause and preventive or eradication of sorrel. The writer of this article holds that the presence of sorrel indicates acidity in the soil, which is an assertion I do not altogether agree with. Therefore for the good of those who read this paper, I will give what I consider the true version on this subject.

If sorrel only grew in a soil possessing a sour property, a person would naturally think that sugar cane would only grow where the soil is sweet, but we find both sorrel and sugar cane growing side by side in the same soil. That sorrel is natural to certain soils I will admit, but the sour property of this plant is caused by the action of the atmosphere and sun upon its juices.

To show more plainly that the soil has little or nothing to do with the taste of different plants, I will call your attention to the apple, or any tree which can be grafted. If a farmer has an apple tree which bears an inferior sweet or sour apple, the first thing he thinks of (if he is an intelligent farmer) is to have it grafted with some more marketable kind. Or, he might have every limb bearing a different kind of apple, without any previous alteration in the soil, thus plainly showing that the change takes place wholly above the surface of the soil.

That summer fallowing will destroy sorrel, I will admit, but the reason that lime and salt appear to destroy it, is because it makes a change in the soil which is not agreeable to its growth, therefore it must die.

I suppose nearly every farmer has seen that plant which belongs to the order of ferns, commonly called "Devil's Guts," or "Old Man's Beard," growing on certain low land, or damp ground, of which I remember hearing a man say it indicated a sour property of the soil; but just under-drawn that soil and its days are numbered in that place, thus

plainly showing that it delights in a soil having an excess of water. And so it is through the whole vegetable kingdom, especially that part which is found in its natural state.

This peculiar property is not wholly confined to the vegetable, but we find it strongly marked in the animal kingdom. For instance, in the Highlands of Scotland, we find a small breed of half-wild cattle, while on the low land, or most fertile parts of England, we find the heavy Durham. On the Chalk hills of England the Southdown sheep only are found, while on the lower or heavy land we find Cotswold and Lincoln sheep, two breeds much larger than the former, therefore requiring a more luxuriant vegetable growth than could be found on the Chalk hills.

E. B. P.

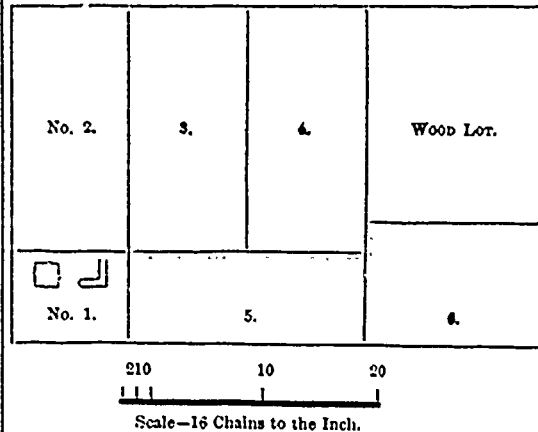
Brant, Ont.

The expression "acidity" was not used in the literal sense in which our correspondent has taken it, viz., that the sorrel derives its acid taste from the influence upon it of the state of the soil. What was meant by the paragraph was that the presence of sorrel showed a sour or bad state of the soil which a clean summer fallow or the application of lime and salt would rectify.

Laying Out a Newly-Cleared Farm.

In the CANADA FARMER of March 15th, "Farmer" asks for help in laying out his farm. As the subject was occupying my thoughts not very long ago, I send him the condensed result of them.

In fencing a farm, I want my fields as large as can be, to save fencing and land; as regular in form as possible, to



facilitate ploughing, &c., and as many opening direct into the barn-yard as I can make do so, for convenience in hauling, and to save roads, either permanent or through crops. Some five fields will commonly be division enough in a moderate-sized farm, and so I would divide the land in question somewhat as in the plan above. No. 1 would enclose house and barn, and the rest of the field would do for permanent meadow or pasture, and if now laying out the farm would, if otherwise suitable, do for an orchard. It takes up about ten acres. Nos. 2, 3, and 5 are each twenty acres; Nos. 4 and 6, being each a trifle more or less than that, according to size and shape of wood lot. A second fence along the dotted line will enclose the only permanent road needed, and let his stock have the run of the bush, if "Farmer" is so disposed.

Orillia, Ont.

A BACKWOODS FARMER.

Reducing Bones.

EDITOR CANADA FARMER:—Can you give me a recipe for reducing bones by fermentation—not the one given in the FARMER of April 15, 1874?

OLD SUBSCRIBER.

Put the bones in a barrel, and mix with them about an equal proportion of ashes. Keep them always wet with soap-suds, applied as hot as possible, but not in such quantity as to leach the ashes. The bones will be disintegrated in the course of a few months.

Or, try the following method of reducing bones which is given in the New York Tribune: To 100 pounds of rather finely ground bone take 25 pounds oil of vitriol, sift out about two-thirds of the coarsest bone, put in a tub made by sawing in two a fish barrel or hoghead, moisten uniformly and well with water, then add gradually the vitriol, stirring and mixing thoroughly. Let it stand 24 hours, or until the coarsest parts are well softened, then mix in the finer part of the bone, which will dry the mass and fit it for handling. If the bones are very coarse, more acid, by 5 or 10 pounds, may be used. If the bones are unground it is more trouble to dissolve them in acid than they are

worth. In that case either reduce with ashes, or burn them, and dissolve the burned bone in acid. To reduce with ashes requires several weeks of time. Pack them, after breaking up with a sledge somewhat, in a barrel or box, filling the chinks up entirely with wood ashes, then pour in enough water to wet the whole, but not enough to drip out from the vessel. In time, if kept moist, the animal matter of the bone will decompose, and the whole mass may be crushed to powder. To burn bones, build them up in a heap on a low pile of wood and set fire. When burned they can be mostly crushed with a flail or sledge. The powder is treated as directed for bone dust, except that 60 or 65 pounds of oil of vitriol may be used for 100 of the burned bone.

Experience in Raising Turnips.

EDITOR CANADA FARMER:—This is my three years' experience in raising turnips on land that is bad with weeds. The first time I tried them broadcast and had 300 bushels. The second time I tried them in drills and only had 250 bushels. Both seasons were alike favorable. Those in drills were a much better sample. It seemed as if it was a profitable crop both times, if there had not been so much work with the weeds. They were in the same field each year but on a different place. The land was all alike.

The next year I thought I would try some plan to get clear of so many weeds. I hardly know how to do, but I was determined to try something; so I prepared the ground as early as I could get on it. I had a good iron harrow which fitted the ground, no matter what shape it was. I went to the blacksmith and got irons made that I could fit into the harrow for cutting and tearing out weeds. The ground being prepared, as soon as the weeds came up about an inch or two high, I went over it with the harrow which made a complete job in cutting and rooting them up. I then left them until the weeds came up the second time. Then I took the harrow and cleaned them off again. I let the land lie a few days and then I sowed it broadcast. I was sure the seed was good, because I raised it myself; and I sowed it very thin. It came up very even, and the plan of killing the weeds proved successful. There were a few weeds come up, but the turnips were so far ahead of them that they amounted to nothing.

As it happened that year, on account of a lot of extra work, I did not get anything more done to the turnips, but after taking them up, I had 350 bushels of good large-sized roots, beside a lot of small ones which were left in the field. Oneida, Ont. J. E.

DRILLING CORN FOR A CROP.—An Indiana farmer is satisfied that the immediate result of drilling in corn is an increase of ten to fifteen bushels per acre, to say nothing of the economized labor both in planting and tending.

PLOUGHING IN AUGUST.—Says old "Walks and Talks" in the American Agriculturist:—Mr. "G. B.," of Nebraska, who asked me some time ago whether I would plough land when it was dry in August, wrote me again just before winter set in, that if he had waited, he should not have needed to ask the question, for says he, "I could not help noticing that the land ploughed in August is in by far the best condition now," and also that "land ploughed a year ago, when very dry, now ploughs up again in much better condition than that ploughed when the land was wetter." This is precisely in accordance with my own experience.

TURNIPS AND CORN TOGETHER.—A Westchester Co., N. Y. farmer is in the habit of sowing yellow Aberdeen turnips among his corn at the last passage of the cultivator, when the plants are about five feet in height. The turnips do not make much growth until the corn is cut, after which they swell rapidly. The cost is nothing except for seed and harvesting, and corn, being already cut, is not injured when the turnips are gathered in. From one to four hundred bushels of turnips per acre have been thus obtained without lessening the corn crop. Weeds are not tolerated, and the whole strength of the land is devoted, as it should be, to useful crops.

PRESERVING MANURE.—The Boston Journal of Chemistry states that the sources of loss in the storage of manure are two: first, the escape of volatile ammonia and other gases; and secondly, the loss of valuable salts by leaching. The first difficulty may be obviated by covering the excrement with eight or ten inches of good soil or loam, which will absorb all escaping gases. A bushel or so of plaster may be advantageously scattered over the heap before the soil is thrown on. The whole mass should be perfectly covered, leaving no "chimney" for gaseous exudation. The danger of leaching may be avoided by covering the heap with hay or straw sufficiently thick to shed most of the rain. If kept in this way a sufficient time, the manure will undergo spontaneous decomposition, the products of which will be ready for immediate assimilation by plants. The usual process of carting manure to the fields in the autumn to waste, by both the above processes, some of their most valuable constituents, should be avoided.

Grasses and Forage Plants.

Alsiko Clover.

EDITOR CANADA FARMER:—Six years ago, I sowed five pounds of Alsiko as an experiment, in a rather low spot in the middle of a field, the remainder of which was seeded down with Red Clover and Timothy. The summer turned out so dry and hot, that scarcely any of either grew, and the next winter killed, as I thought, the rest; so that, in the following spring, I put in a crop of oats with the cultivator, seeding down again the whole piece with a plentiful supply of Red Clover and Timothy.

Of course I thought that, under such John-Barley-Corn treatment, the Alsiko would be dead. Not so, however; on the contrary, it has increased and multiplied until it now fills the ground in place of the Red, which is dead and gone long ago.

Three years ago I mixed twenty pounds of Alsiko with sixty pounds of Red, and then added an equal bulk of Timothy. With this mixture I seeded down about fourteen acres. The first year I had a nice crop of Red Clover, with here and there a plant of Alsiko and Timothy. The next year I had a crop of Alsiko and Timothy, with a little Red. The result was so much in favor of Alsiko, that I seeded seventy acres with it last spring, on the high land, mixed with Red, and on the low land with Timothy without any Red Clover. I should prefer Red on the high land, but it soon dies out, and I think "a live dog is better than a dead lion."

S. GOING.

Wolfe Island, Ont.

Mixture of Grass Seeds for Permanent Meadows.

EDITOR CANADA FARMER:—What mixture of grass seeds would you recommend for a piece of light sandy land, that has lam in common and then had a crop of potatoes, and a crop of roots taken from it. I intend to raise a crop of corn and clean it ready for seeding down next year.

YAWSHUR.

Brantford, Ont.

We should recommend the varieties and quantities following per acre, which are those advised by Flint, one of the best authorities on the subject:

Meadow Foxtail	1 lb.
Orchard Grass	6 "
Sweet scented Vernal Grass.....	1 "
Meadow Fescue.....	2 "
Red Top.....	2 "
Kentucky Blue Grass.....	4 "
Italian Rye Grass.....	4 "
Perennial Rye Grass.....	6 "
Timothy.....	3 "
Rough Stalked Meadow Grass.....	2 "
White Clover.....	5 "

This will be rather thicker seeding than most farmers would be willing to go to the expense of; but it is now an accepted fact that thick seeding increases the crop, and improves the quality of the grasses.

In England, more varieties are used. A recent writer recommends a mixture of the following varieties: Meadow Foxtail, Sweet Vernal, Crested Dogtail, Rough Cocksfoot, Hard Fescue, Meadow Fescue, Various-leaved Fescue, Sheep's Fescue, Red Fescue, Evergreen Rye-grass, Sutton's Perennial Rye-grass, Pacey's Perennial Rye-grass, Timothy, Smooth-stalked Meadow Grass, Rough-stalked Meadow Grass, Yellow Trefoil, Perennial White Clover, Perennial Red Clover, Alsiko Clover.

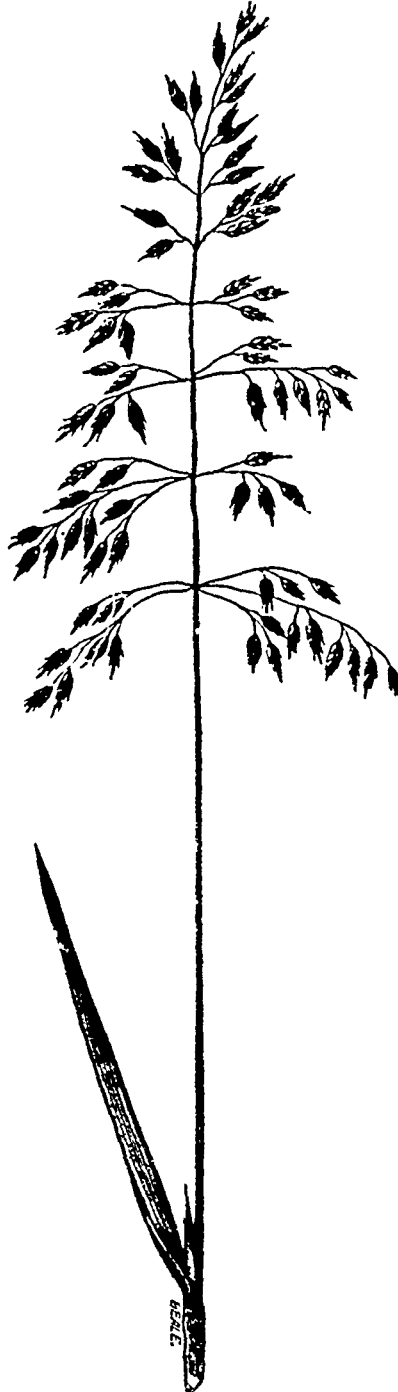
These grasses have excellent qualities, all of them, and as they mature successively, they give, under good management, a permanent sward.

A CASE OF THICK SEEDING.—In the spring of 1872, says a Maine Farmer correspondent, I sowed six acres of land to oats and grass seed. The season was very dry and when I harvested the oats, there was no grass to be seen, although I put on sixty lbs. of clover, three pecks of timothy, one-half bushel red top and one-half bushel fowl meadow grass; but, supposing that I should get no grass from that seeding, the next spring as soon as the knolls began to show themselves, I sowed on 43 lbs. clover, three pecks herd's grass, and about the first of Sept., mowed the most part of it, getting about one ton per acre. It was just beginning to throw out the heads and it was about the best seeded piece that I ever saw and I really believe that both seedings came and grew, it was so thick.

The Rough Stalked Meadow Grass, "Poa Trivialis."

The grass of which an illustration is given on this page, is the Rough-stalked Meadow-grass, *Poa trivialis*. It has been known for some centuries in England as the Orchard grass. This is the best adapted of all grasses for succeeding in the shade, excelling in this respect even the Orchard grass, *Dactylis glomerata*, illustrated in our last issue.

It mixes well with Orchard grass for shaded situations, and is more productive when mixed with other grasses than when sown alone. It will not succeed in open lawns, where it is frequently cut, as it does not endure sunshining particularly well. The seed weighs about fifteen pounds



to the bushel. If sown alone, twelve pounds will be about the right quantity; but as it succeeds best when mixed with other varieties, it is seldom sown alone. It has fibrous roots. It does not start so early in the spring as some others of the same family, but it grows rapidly when the weather becomes warm.

Cattle are very fond of this grass, and will keep closely cropped those spots of the pastures where it grows.

The Rough-stalked Meadow grass closely resembles its ally, the Kentucky Blue grass, otherwise known as June grass or Smooth-stalk Meadow grass, and scientifically, *Poa pratensis*. The seeds of the two varieties may be known apart by the *Poa trivialis* being short, round and flat on the face, and smaller generally. The seeds of *Poa*

pratensis appear concave to their face, and are longer in proportion to their width. The grasses themselves are distinguishable by the rough sheaths and culms and fibrous roots of *Poa trivialis*; the *pratensis* having smooth sheaths and culms and creeping roots. The *trivialis* comes into flower nearly a month later than the *pratensis*.

Top-dressing Grass Lands.

The success or failure of farming operations depends largely upon the mode and time of applying manure. No matter how applied, manure never fails to benefit the soil, and rarely fails to benefit the growing crop. But it may be used so that it will do comparatively little good, either to soil or crop. In this section, most of the rotted manure from barnyards in the fall, is used as top-dressing on wheat. The "patchy" appearance of top-dressed wheat, however, results from an attempt to make a small quantity of manure produce a crop on poor soil. To have the best effect on wheat, manure should be applied on the surface some time before sowing, and thoroughly incorporated with the surface soil by frequent harrowing. But the best farmers in this section apply manure as a top-dressing for grass lands and young clover. To produce its best effect, clover should have as large a growth as possible. In a large growth, the long top roots strike down deeper, and not only loosen the subsoil, but bring up fertilizing mineral elements that have leached down during years of shallow culture. Even if the clover be cut for hay, the extra growth of roots leaves the land much richer than if no manure were used, and the entire crop ploughed under. A good plan is to apply all the finer and well-rotted portions of the manure to the young clover of this year's seeding. This will be washed down among the roots by winter snows and spring rains, and give the clover an early and vigorous start next season. Manures are much more apt to wash away on wheat fields than on clover, especially if the wheat has a small growth. This is one point which your able correspondent, Mr. Geddes, did not mention in his recent advice to a young farmer to top-dress wheat. While I agree that top-dressing wheat is generally beneficial, I think it still better to use the same amount of manure on clover. There is a temptation to apply the manure directly to wheat, for that is a crop which brings the money most readily. But if the land can be most benefited and after-crops largely increased by top-dressing clover, that is the best policy.

It is rare that several loads of "scrapings" cannot be found at this season in barn-yards. These should be drawn and spread on young clover. Even good, rich soil from the road-side will pay to draw, if not too far. The droppings of horses and cattle should also be knocked to pieces in clover and other pasture fields. There is a great advantage in this, even if the field is to be ploughed next summer. Gypsum (or plaster) should always be sown on surface manured land. It is a specific manure for clover, and though not always uniformly beneficial, generally does enough good to warrant the small expense of applying it.—W. J. F., in *New York Times*.

Best time for Seeding to Grass.

A Genesee Co., N. Y., correspondent of the *Live Stock Journal*, has the following on the time for seeding to grass and the way to do it:

For the grasses, we find fall seeding very much surer of a good "catch," than to sow in the spring. But we find it most practical in many cases, to seed without grain. A piece of lawn, or orchard, or some small lot that I want to seed down very nice, I would manure well in the spring, and plant with early potatoes. By working them thoroughly, this cleans the ground, mixes the manure well with the soil, and by harvesting potatoes early, I can cultivate and prepare a good seed-bed for grass by the 16th of August; from then to the 1st of September is our best time for seeding to grass alone, for then we are almost sure of a good "catch." The weeds seldom grow in the fall to choke the seed, and it gets so good a start as to insure a good crop for the next season.

I once sowed clover with orchard grass on the 20th of August, which did very well, and the next June I cut what the men called two and one-half tons to the acre. I never lost a seeding, or had a partial failure, sowing grass seed in the fall, on well prepared ground. But for large fields we generally seed with grain, and the fall growth is often so thrifty, that to avoid its choking, or checking the growth of the wheat, the farmer will sometimes sow the grass seed a month after sowing his wheat, and then have it stocky enough, though I prefer to sow grass seed about the time I put in the wheat.

I think for fall seeding it does not require as much seed to the acre, for then all the seed seems to grow. This fall, I sowed only four bushels of best timothy on twenty-eight acres, with grain put in about the 9th and 10th of September, which is now growing so thickly, that I fear I shall not get a catch of clover with it, though I shall sow it about twelve pounds to the acre, early in the spring.

Implements.

Plough and Seeder Combined.

There has been invented in England a new patent grain sower, which is to be attached to the plough, and perform the operation of sowing at the same time as the ploughing. It is stated that, on light land, it works well, distributing beans and peas with as great facility as it does cereals. A lever for lifting it out of work is fixed to the top of the right-hand side of the plough, the attaching chain working on the inner side of the handle. A brush on the roller regulates the quantity of seed to be distributed. Hard set down upon the roller, the brush prevents much seed from falling; allowing the brush more scope, a larger quantity of seed naturally falls.

The implement has received a silver medal from the Manchester and Liverpool Agricultural Society. It is not stated in what particulars lie its advantages over similar inventions having the same object.

Potato Diggers.

EDITOR CANADA FARMER:—As I was reading in the FARMER, I noticed "Nuts for Inventors to Crack." I read it and after doing so the idea struck me that I would like to make a suggestion in regard to digging potatoes. It would be a very good thing if we could go to an Agricultural Implement Depot, and order a potato-digger that would work well in all kinds of soil, dry or damp, hills or flats, and be suitable for small patches or large patches, round or three-cornered patches. I have not the least doubt that such a thing is not in existence. I know some people who have potato diggers, and they think a great deal of them too, but some years, by the situation, the ground and the weather, they don't use them at all.

I have seen a great deal of potato-diggers at shows, and I have seen a great many at work and the suggestion I wish to make is this:—I think that if an apparatus, something in the nature of a plough, with an oval shaped bottom would go along a row raising potatoes, earth, and all together, and turn the furrow as it were upside down on its own ground, it would be profitable. No one will hesitate in thinking that such an apparatus could be made and sold under ten dollars. It would work in all kinds of land, wet or dry.

J. E.

Oncida, Ont.

A Talk about Windmills.

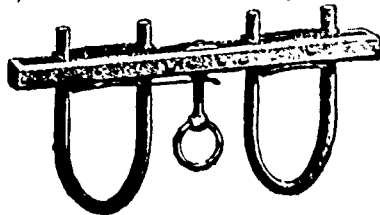
At a meeting of the Rosendale, Wis., Agricultural Club, the subject for discussion was "Power and its Application to Farm Purposes." Mr. Jewett referred to the different kinds of powers in use on the farm, as, horse-power, steam-power, more recently, wind. He said the most effectual power is brains, and this power is applicable to all kinds of farm uses. The machinery used on the farm at the present day, demand more intellectual work and less muscular power to operate them than did the old style of hand implements. The common school lies at the basis of farm power. To the degree that we keep up our schools and educate the mind, so far will the power of the farmer be felt.

Mr. Judd said wind power, in its application to farm purposes, was in its infancy in this country. He spoke of its cheapness, as compared with horse and steam-power. These are indispensable for propelling movable machinery, but for all stationary work, such as sawing wood, grinding grain, cutting feed, shelling corn, pumping water, &c., wind-power might be used. He had seen a thrashing-machine, without a cleaner, successfully operated by wind. Windmills have been mostly a failure in this country, except for pumping water, but they are being rapidly improved, and the time will soon come, when the great power which is ever sweeping over our Western prairies will be caught and harnessed to work. In buying a wind mill Mr Judd advised the farmers to get a geared mill, so that, if wanted, it could be attached to machinery. The cost of such a mill is from \$300 upward, according to size.

Mr. Inms, Mr. Woodruff and many others, were well pleased with the work done by wind in pumping water. Some would not exchange such an arrangement for watering stock for the best brook or spring.

Sliding Ox-Yokes.

The sliding ox-yoke illustrated below is a recent American invention, stated to be of great utility for oxen inclined to haul or crowd. Its advantages are best seen, it is claimed, when the oxen are working on rough ground,

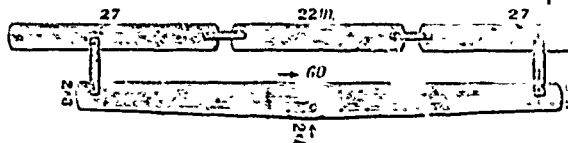


on new clearings or on roads with deep ruts, as it enables them to work near together or far apart as the exigencies of the case permit.

A New Three-Horse Equalizer.

Several devices have been invented for the purpose of equalizing the draught, when three horses are used abreast. Probably the best known is the one termed, in the United States, the "Kalamazoo clevis;" so named from a town in Michigan where the inventor resided. In this, the clevis attaching the draw-bar to the plough or other implement is placed one-third of the distance from the end. Two horses draw from the shorter end, by a common pair of whiffletrees, and one horse draws from the long end.

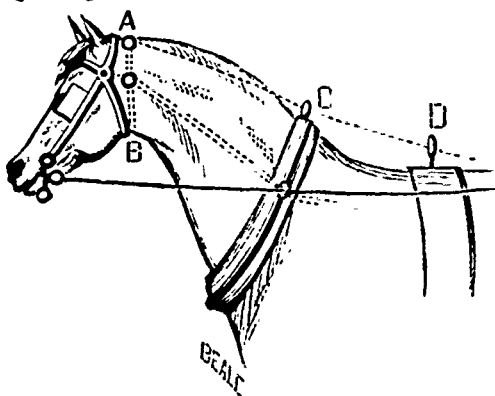
A very simple device for equalizing the draught by three horses abreast, is illustrated below. The scale upon which it is drawn is one-half inch to a foot. It is composed of



three pieces of oak or other tough wood 2 inches thick by 3 inches wide, (one piece 22 inches long, the other two 27 inches each). These are joined together, as shown, by straps or pieces of 1 x 1/2 wrought iron. One piece above and the other below, and bolted together. These three pieces are then attached to the doubletree proper (which is 5 feet long, 2 inches thick, 4 inches wide at the centre and 3 inches at each end) by the wrought iron straps. The horses are attached to it by means of ordinary singletrees, which can be removed when required for other purposes.

A Check for Runaways.

So many accidents result in fatal consequences from the inability to check a runaway horse, when he has once got fairly frightened, that the accompanying illustration of a simple mode of bringing the animal to a stop will be examined with interest. The plan consists in a modification of the "lasso" used in capturing wild horses, and scarcely less wild cattle, in South America and the Spanish parts of North America. An objection will be made that the tightening of the noose will cause the horse to kick and



plunge vigorously: but, as between that evil, and the greater one of not being able to stop him, it does not appear doubtful where the choice should lie.

A thong with metal ring attached is sewn firmly to the halter at A, so as to lie on the neck at the back of the head. To this ring, one end of a leather thong or bleached rope is fixed; it is passed round the neck of the horse, as at A, B, and the other end is slipped through the same ring. This

end is then carried through a ring on the collar and saddle, as at C and D, or only through D, and is then fastened to some point on the splash-board of the carriage, or driver's box, within easy reach of the coachman. This "lasso," of strong leather or bleached rope, can, of course, be fixed under the mane of the horse, so as not to be easily seen. Should the horse bolt, the noose is drawn tight, and the throttled horse will soon pull up, unable to breathe. The apparatus costs little, and is no unsightly addition to the harness. The single dotted line in the sketch represents the "lasso." With the double dotted lines another is shown, and perhaps in a better position for the "lasso"—the ring being placed half way down the neck of the horse, and the rope or thong slipped through the same rings as the reins.

Forging Tools.

A correspondent of the *Scientific American*, who has evidently had much experience in forging tools, writes to that paper as follows:

My experience has been that no amount of skill and care in hardening and tempering can make a right down good tool of one not judiciously forged. In forging bring the steel to a mellow heat, and keep it so until you have your tool forged to shape. As the heat declines to black hot, compact your steel by light hammering on the face of the tool, but do not hammer the tool edgewise. Now if the tool is ready to harden, when it is heated it will swell so as to loosen up the compacting that was done by light hammering, as it was cooling off. So it follows that whatever will harden the steel at the least heat will do it the best.

I use strong cold brine, and want it near the fire, so as to utilize all the heat in the tool. As soon as the tool is cool, I dip it in oil (sperm or whale oil preferred). Now hold the tool over a well burnt-down fire, without the wind on. Hold the tool so as to retain as much of the oil on it as possible. Now tip it up slightly so as to make the oil flow from over the hottest part to the edge. The oil becomes a carrier of heat, and will help to let down the temper (exactly alike every time) from any thick part to a delicate cutting edge. I think the colour that comes on the steel under hot oil can be depended upon much more than without oil, although it (the colour) will be a little tardy. In letting down the temper I want to do it slow enough at last, so that I can lay down the tool to cool off, and not have to dip again. But if it is going too low, I invert it, and dip the body part and leave the edge out. There are very few tools in which I like to leave heat enough in the body to let down the temper with, for this reason, as I grind back on the tool, the cutting edge is apt to get a little farther from the outside film of refined steel. This film is harder than the steel under it, so I would leave the tool slightly harder a little way back from the end; whereas, if you run out heat enough from the body of the tool you will very soon be at work with a tool altogether too soft.

THE BEST DRILL.—Will not some farmers give their opinion on which is the best drill for sowing grain?—*John Lang, Puslinch, Ont.*

A CORN-MARKER.—A good corn-marker for mellow ground is made by taking a strip of board, four inches wide and eight feet long. If the rows are to be four feet apart, nail a sharpened leg on each end, and two sticks or thills to draw it by, about four feet apart, one each side of the centre. Then fasten a light chain in the middle, and you have such a marker as I have drawn over ten acres in half a day, making marks plain enough to follow the first time through with the cultivator.—*Cor. Western Rural.*

OIL STONES.—Wood-workmen often experience much difficulty in procuring good oil stones—those that cut rapidly and leave a fine edge. The Turkey stone has no superior in the production of a fine edge, and for this reason it is preferred by all who work on soft wood, but it cuts slowly, and large ones are seldom without hard spots and streaks. These stones, consequently, do not answer for the carriage maker as well as some other kinds, though it is well to have one for putting a fine edge on plane irons when finished up and cleaning off whitewood and basswood panels. The Arkansas is a good stone for general use, but in most cases it does not produce a good cutting edge for soft wood; it, however, cuts rapidly, and is preferable to the Turkey stone. One of the best stones for the workshop is the Scotch gray. This cuts rapidly, and leaves a keen, fine edge. The best we have seen were in irregular blocks, one edge of which was faced off; they were quite soft, yet very firm, and entirely free from hard spots or other blemishes. They do not gum up as quickly as do other stones, and can be cleaned with turpentine without injury. Some of the common stones are good, but they grow hard from the effects of the oil used.

Horticulture.

THE ORCHARD.

Starting an Orchard.

Every farmer who is not already the possessor of a good orchard, should plant one. There is no surer way of adding to the value of a farm, than by the setting out of a few acres of judiciously chosen fruit-trees. The present year will be a good one for the far-sighted farmer to plant, or to renovate an orchard, for the reason that the past was an unusually abundant fruit season, and prices are somewhat depressed. The necessary consequence will be that many of those who are easily disheartened, will be sickened with fruit growing, and will not seek to extend their orchards. The demand for young trees will probably be smaller this year, from the natural disgust of fruit-growers at the lowness of price, which lowness some will be inclined to think an indication that the limit of the public capacity to consume fruit, has been reached. A little consideration will dispose of this bugbear. The public appetite for fruit is one which is sure to grow. An abundant year and low prices are a blessing to the fruit-grower, in that they induce a habit of eating fruit in persons who, otherwise, would have dispensed with it. They find their health benefited, and continue the consumption, although prices may increase. The number of habitual fruit-consumers is increasing in faster ratio than the population. The export trade of apples and other fruit to Europe is also assuming great proportions; and it is sufficiently demonstrated that apples can be laid down in England, at a paying price much below the figure at which that country can usually produce them. Therefore, we reiterate: Plant orchards, especially apple orchards.

But do not go and plant an orchard without full consideration of what you want an orchard for. Hundreds of Canadian farmers did just this kind of thing years ago, and now find themselves with a species of white elephant on their hands. Their fruit is of all sorts, sizes and qualities, such as cannot be stored together, shipped together, nor eaten together. The mistake was generally made of planting too many varieties. With the modern system of packing apples for transport, this will not do. The motto of the orchardist must be "Hold fast to that which is good." He must not run after strange varieties, or his pocket will suffer. If the fruit is wanted for home use only, and the orchard is intended more as a convenience or ornament, than for profit, some latitude may be allowed in the varieties which may be used. But if intended for profit, and for shipping long distances, the varieties must be few and of widely-known and established character. A variety only locally known, however good it may be, must be rejected from the orchard that is intended for profit.

Articles giving the details of every step of orchard-culture have appeared so recently in the CANADA FARMER, that we deem it unnecessary to give anything but an outline of the *modus operandi* in starting an orchard, the object of this article being rather to set those about starting orchards on the right track with respect to the varieties to be planted.

In selecting the site for the orchard, the average farmer will locate it for convenience, or near the house, paying little attention to whether it be the spot best suited. This is short-sighted policy. Choose a strong soil, well-drained, and if rather rocky, so much the better. A well-elevated position is also to be recommended, but in this case shelter is of prime necessity, and must on no account be overlooked. If not naturally sheltered, belts of ornamental trees should be planted to protect the exposed points from severe and high winds. A high situation, though otherwise suited, could not be considered favorable for planting an orchard without some such protection. If not naturally well-drained, it must be artificially drained. If on a side hill, some experienced orchardists prefer a northern aspect to a southern one; but the question as to which is the better is by no means settled. The best protection from the sun for trees on a steep hill-side is to have short stem trees, branching not more than two to three feet from the ground. The tops of such trees protect the trunks, the most vital parts.

Trees on high ground are not nearly so subject to winter-

killing as those on low ground; therefore high ground is to be preferred to low ground. The soil should be in the best possible condition, clean, free from weeds, and perfectly friable.

One of the most common errors usually made, is to plant when only the top of the soil is thawed, and there is a substratum of frost beneath. Wait until the earth is thoroughly thawed out. Deep planting is one of the gravest errors that can be made. Newly set trees should on no account be planted deeper than they stood in the nursery.

The trees should be planted in rows, regularly, for ease in cultivation. For apples, from twenty-five to thirty feet apart is best; for pears, eighteen feet; for cherry and plums, twelve feet.

In the district of Ontario between the great lakes, nearly every really valuable apple will come to perfection. As we recede from the lakes, the varieties become fewer, but in all the settled parts of the Dominion apples may be grown of the hardier kinds. Where apples can be grown profitably at all, the best seven varieties to plant would be the well-known Fameuse, Northern Spy, Duchess of Oldenburgh, Early Harvest, St. Lawrence, Red Astrachan, and Golden Russet. In milder sections, the King of Tompkins County, Gravenstein, Hubbardston Nonsuch, Rhode Island Greening, Swayzio Pomme Grise, Baldwin and Roxbury Russet are also paying varieties.

There is not so much money in pears as in apples, except in unusual seasons. The varieties that can be grown profitably are few. Still, there are few people who positively dislike a ripe, luscious pear; and the farmer who is laying



out an orchard for profit, can well afford the ground occupied by a tree or two. The Vicar of Winkfield, Flemish Beauty, Louise Bonne de Jersey, Sheldon and Beurre d'Anjou, we judge to be the six varieties most likely to yield a profit. Of these, the Beurre d'Anjou, Flemish Beauty, and Vicar of Winkfield are best suited for districts out of the reach of lake influence. The Bartlett can be grown successfully south of the Great Western Railway.

Of cherries, the Early Richmond is the best paying variety, and is hardly enough to flourish anywhere that cherries will grow at all. The Kentish will rank about next. Cherries thrive best in sheltered corners and in valleys.

Of plums, the Lombard, Yellow Gage, Yellow Egg, Smith's Orleans, Washington, and Coe's Golden-drop, will be found among those most likely to prove remunerative.

It will be well for the intending fruit-grower to visit all the orchards in his neighborhood, which have similar soil, exposure, etc., to his own, and notice the varieties which thrive best and prove most profitable therein. By so doing he may save himself an annoying and costly failure.

Fruit-Buds and Leaf-Buds.

As the time for budding and grafting is at hand, an explanation of the difference between fruit buds and leaf-buds will be timely. In these two operations, fruit-buds are rarely used, and that only in making experiments.

In the engraving A represents a pear shoot, and B a cherry. Fruit or flower buds are usually round at the point, as at b, b, b, in both figures; leaf buds are slender and sharp, as at c, c, c. By carefully cutting them open under a microscope, by means of a sharp knife, you may detect the parts of the flower in one instance, and the innate leaves in the other. The readiest way, however, to become acquainted with the difference between the two kinds of buds, is to observe

them when they are swelling in the spring, and afterwards examine them when open. We copy the engraving from the *Country Gentleman*.

Liquid Grafting Wax.

Mr. L'Homme-Lefort invented, not many years ago, a grafting composition which is very cheap, very easily prepared, and keeps, corked up in a bottle with a tolerably wide mouth, at least six months unaltered. It is laid on in as thin a coat as possible, by means of a flat piece of wood. Within a few days it will be as hard as a stone. It is not affected by severe cold; it never softens or cracks when exposed to atmospheric action. When applied to wounds in trees, it acts as an artificial cuticle. After a few days' exposure to the atmosphere in a thin coat, it assumes a whitish color, and becomes as hard as stone, being impervious to water and air. As long as the inventor kept the preparation secret, it was sold at very high prices.

It is made after the following formula: Melt one pound of common rosin over a gentle fire; add to it an ounce of beef tallow and stir it well. Take it from the fire, let it cool down a little, and then mix with it a tablespoonful of spirits of turpentine, and after that about seven ounces of very strong alcohol (95 per cent), to be had at any druggist's store. The alcohol cools it down so rapidly that it will be necessary to put it again on the fire, stirring it constantly. Still the utmost care must be exercised to prevent the alcohol from getting inflamed. To avoid it, the best way is to remove the vessel from the fire, when the lump that may have been formed, commences melting again. This must be continued till the whole is a homogeneous mass similar to honey.

This is undoubtedly a valuable recipe. I have found that gum shellac, dissolved in alcohol, was one of the most useful preparations that a gardener could have, and it should always be kept on hand and used like paint, to coat over any wounds in trees. In budding, it is a great saving of labor, when you wish to cut away branches, to give the new one from the bud an opportunity to grow, as it excludes the air until the wound heals.—*New York Tribune*.

Hybridization.

Information wanted. Would some skilled fruit hybridizer give me some information, through the CANADA FARMER, at what time to perform the fertilizing operation on the blossom? Is it before the blossom is fully unfolded, or after? And what part of the blossom must be removed—the central stem or the next surrounding ones? The latter, I suppose, is the male. The March number of the CANADA FARMER gives good directions for grafting, which I understand myself by yearly practising on my own trees; and I would like to practice on hybridizing too.

FRUIT-LOVER.

Markham, Ont.

GRAFTS FROM BEARING TREES.—The *Rural World* states, that no apparent difference has been discovered from long experience, between the bearing qualities of trees grafted from young nursery trees and older bearing ones, adding: "We have often gathered apples from nursery trees when they were but three years old, simply by cutting the roots in digging out contiguous trees. We never go to any trouble to get grafts from bearing trees, unless some doubt exists as to the correctness of the sort."

INARCHING.—Inarching is a kind of grafting, in which the scion is allowed to remain on the parent plant till it becomes united to the stock. To accomplish it, the stock and the plant to be propagated must be grown side by side, or else one or the other of them must be in a pot, so that the two can be placed together. A portion of wood is shaved from the stem of the stock, and a corresponding portion from a branch of the shrub to be propagated. The flat surfaces thus formed are then brought together, bound fast, and covered with wax. In the course of the season they unite, and the shoot, now receiving nourishment from the sap of the stock, is cut from the parent plant, and begins at once an independent growth.

GRAFTING OLD PEAR TREES.—There are many old pear trees, in almost every neighborhood, nearly worthless, as well as some other worked kinds, which crack their fruit, and are unsaleable, that could easily become a source of pleasure and profit, at little expense. Grafting is not very difficult. Cut off the limb, split it, open the split with a small wedge, insert a piece of the limb of the kind wanted, cut like a wedge—say 3 inches in length—putting the inner edges of bark in both graft and limb together, then cover carefully with wax, and nearly all will grow. The wax is easily made. Melt together in a kettle, 1 lb. of tallow and 1 of beeswax, then 4 lbs. of rosin; when melted, pour into a pail of water, and pull it till well mixed. In a selection for six trees, I would use 1 Blood-good, 1 Tyson, 1 Bartlett, 1 Clapp's Favorite, 1 Lawrence and 1 Beurre d'Anjou. For twelve trees, three each of the three last named, as they are splendid varieties, and always saleable.—*Cor. Country Gentleman*.

THE FRUIT GARDEN.

Crapes Cracking.—Sash Frames, etc.

THE CANADA FARMER—I have lately attempted the cultivation of crapes under glass, fruiting them, the last season for the first time. The roots of the vines extend to the outside border. What is the cause of the berries cracking? and what are the best known preventives? Some sorts seem very subject to this disease, the Chasselas Musque, for instance.

Are you aware of any plan for glazing sashes, more simple, expeditious, and economical than the antiquated mode of putting in the glass with putty? NOVICE.

The cause of the berries cracking is probably from the unprepared nature of the soil outside the house into which the roots extend. The ground is probably impacted by the treading of persons around the house.

The best way for glazing sashes will be found to be that in use by most nurserymen, viz., to bed the glass on putty, and put in tacks on the top. There are frames made in which the glass slides into a groove. In practice, they do not work well. There is sometimes a difficulty in extracting bits of glass from the groove when a new pane is to be placed in lieu of a broken one.

Strawberries in Beds.

My ground is clayey, and will grow large berries and runners for plants at the same time; so it is not necessary for me to clip off the runners when the plants are bearing fruit. As early in the spring as the ground can be worked, I prepare the ground and set the plants. I make the beds five feet wide; the paths eighteen inches wide. If the beds are wider, the middle of the bed will be too far distant to reach when standing in the path, taking care of the plants and gathering the fruit. If narrower, there will be too large a proportion of the land devoted to paths.

The plants I set are of the previous years' growth, which can be told by their having whitish roots; older plants have brown or black roots. I set three rows of plants lengthwise of the bed; the plants two feet distant from each other in the rows; the outside rows I set eighteen inches from the line of the path, and the plants in the two rows are set opposite each other, so that the plants in these two rows are two feet distant from each other each way. The plants in the middle row are set opposite to the centre of the rows in the outside rows. In taking care of the plants the first season, I train some of the runners to the places where they are wanted, and pin them down with a wire hook at the time they are taking root, in order that the bed shall be equally covered with plants.

In the latter part of the season, when the beds become covered with plants I clip off the runners in order to prevent the growth of the plants on the bed. The wires spoken of are made of bonnet-wire size, about four inches in length, one end bent like the bend in a hair-pin. Pins with a hook, made from a twig of a tree, will answer the same purpose. If my land were sandy or gravelly, or that which is called warm land, I would dispense with the middle row of plants in the bed, so as to not have the bed too much overrun with plants.—*Cor. Country Gentleman.*

THE SNYDER BLACKBERRY is pronounced to be hardier than the Kittatinny, and an immense bearer.

PREVENTING DAMAGE BY CURRANT WORMS.—Dry ashes are recommended as being a sure preventive against the ravages of the currant worm. When the worms first appear, dust the bush thoroughly with dry ashes when the morning dew is up on them. The application must be repeated two or three times at intervals of a few days, as more worms will hatch from previously laid eggs.

STRAWBERRIES. The *Fruit Farmer* says that the Col. Cutney strawberry is poorly supplied with stamens, and hence it is better to plant every fourth or fifth row with a good fertilizer, which yields fruit equally large and fine, as the Jucunda, Chas. Downing, or Seth Boyden. The two last named are hardy and good bearers. The same journal says, in another place, that the maximum distance for shipping strawberries without injury is 150 to 200 miles—occasionally much farther. The following are named as good shippers for the above named distances.—Nicanor, Wilson, Green Prolific; Seth Boyden, Triomphe de Gand, and Jucunda.

GRAFTING THE GRAPE.—The *New York Times* directs a correspondent who had enquired about grafting grapes thus:—The grape may be grafted with even more facility than some other fruits. The stock should be cut off six inches below the surface with a fine saw and a smooth cut, and the scion inserted in a cleft, just as is done with an apple or pear graft. The stock is then bound with a waxed cloth, and the earth replaced. The scion should be of such a length that the eye is brought to the surface of the ground, but no higher. This work should be done at once, before the sap starts, after which the vine would "bleed" severely. If the stock is large, two or three scions may be grafted upon it.

The Hoosac Thornless Blackberry.

The engraving represents a new variety of blackberry, discovered by Mr. Frank Ford of Ravenna, O., several years ago, while he was on a visit to Massachusetts. While he was berrying one day on the Hoosac Mountain,



he came upon a lot of canes bearing berries of such superior character, that he secured some and propagated them in Ohio. The berries preserved their good qualities and proved very productive and hardy coming through the late severe winters without damage, while other standard varieties were killed. The engraving is a copy from a photograph, reduced about one-half in size. The Hoosac is an entirely thornless variety, so that the gatherer can pass among the canes without danger of casualty to the clothing.

THE FLOWER GARDEN.

The Aster.

The Aster, says James Vick, was popular when we had our little garden nearly half a century ago. We used to call it then China Aster, but those children who wished to



be very nice would say *Reine Marguerite*, and would often get laughed at for preferring so hard a name, just because it was French. The Aster was sent to France from China by a missionary, and the English name means China star, while the French is Queen Daisy. It was then a single, showy flower, bearing not much more resemblance to the

Aster of to-day than the mayweed does to the dahlia. However, we thought it very pretty, and it afforded us a great deal of pleasure.

The Aster now is a general favorite, and its popularity is on the increase. For an autumn show of flowers, we were about to say, we have not its equal, but we are reminded that when we get enthusiastic over any of our special favorites, we are ready to say the same thing about a good many. Perhaps we can safely say that for an autumn display it has no successful rival among the annuals. Give the Aster a deep, rich, soil, and mulching with coarse manure is very beneficial, and if extra fine flowers are needed for exhibition or any other purpose, a little liquid manure occasionally will give the most gratifying results. Plants may be grown in the hot-bed, cold frame, or a seed-bed in the garden, but to obtain good flowers the Aster plant must be strong and "stocky." A plant that is what gardeners call "drawn" will never produce very fine flowers. A "drawn" plant is one that, by being crowded in the seed-bed, or some other cause, has become tall, slender and weak.

The Aster transplants easily. Twelve inches apart is the proper distance for making a showy bed of the large varieties; the dwarf kinds may be set six inches or less. It is not best to have Asters flower too early in the season, and there need be no haste in starting seed in the spring, for the Aster, like the dahlia, is essentially a fall flower, and the flowers are always the largest and most perfect and enduring in the showery weather and cool, dewy nights of autumn. The tall varieties with large flowers need a little support, or during storms of wind and rain they are often blown down and their beauty destroyed when in full blossom. Set a stake in the ground near the main stem, so that its top is only about two-thirds the height of the plant. Then fasten the main branches to this stake, not in the way too common, which is merely to pass a string around the whole plant, stake and all, thus injuring both foliage and flowers. The proper way is to attach several strings to the stake, so that they will not slip down, then pass each one around two or so of the main branches in a kind of loop or sling, so that the plant will retain its natural position, and may be swayed by the wind without receiving the least injury.

Asters are so very dissimilar in habit, ranging from the little dwarf, scarcely six inches in height, to the stately plant of more than three feet, and bearing flowers almost as large as a peony, that a few words seem necessary to prevent persons purchasing what they do not desire. The smallest of the family is the little *Dwarf Bouquet*, which presents a bouquet of flowers about five or six inches in height, with scarcely a leaf. These are excellent for borders around beds. The *Dwarf Pyramidal Bouquets* make plants from ten to twelve inches in height. Next in height is the *New Schiller*, about fifteen inches, of very peculiar habit, the leaves being almost entirely at the base of the plant, and drooping. Another class, like the *Imbricque Pompon* and *Chrysanthemum-flowered*, grow from eighteen inches to two feet in height, while the tallest class, represented by the *New Rose*, *Perfection*, and others, range from two to three feet.

FRAGRANCE AND THE "TEARFUL BULB."—The *German-town Telegraph* is authority for this: It is said that onions certainly increase the fragrance of flowers, and that if a large onion is planted near a rosebush, so as to touch its roots, the odors of the flowers will be wonderfully increased, and the water distilled from these roses far superior to any other.

ADIANTUM FARLEYENSE.—Those who have seen this beautiful fern, and have thought one a foot in diameter a good one, will open their eyes at the annexed statement of a correspondent of the *Gardeners Chronicle*. No doubt, some of your readers, when visiting the Liverpool Chrysanthemum Show, were struck with the magnificent specimen of *Adiantum Farleyense* exhibited by Mr. Cromwell, gardener to Thomas Moss, Esq. I for one was astounded. It measured fully 6 feet through, and was one dense mass of fine fronds, all in perfect health and beauty. *Adiantum Farleyense* is the queen of ferns, without doubt, and the specimen referred to excited the admiration of all who saw it. It was evident it had been at home in the hands of Mr. Cromwell, as he must have thoroughly understood the nature of all its wants.

GARDEN LABELS.—"An amateur" writes in an English journal: I use labels made of glass, and write the name of the plants upon them with a diamond, or they can be written upon with a blacklead pencil when they are required for flower seeds, or for one season only. For espaliers or wall trees I drill a hole through one end of the labels, so as to suspend them with copper wire, or nail them to a wall with copper nails. If nails are used, they should not fit the holes too tight, nor should they be driven quite home, so as to allow the glass to expand a little when warm. Made plain without holes, the cost per label would not exceed 1d. each; with holes about 2d. each. Small labels could be made for pot plants at about 6d. per dozen.

THE VEGETABLE GARDEN.

Slugs.

EDITOR CANADA FARMER:—I am gardening a piece of low land which is infested with the slug, so much so that they eat through my cabbage, tomatoes, spinach, cauliflowers, and plough and groove my celery, and in fact they attack everything to their taste. If you will be so kind as to tell me in your next issue what to do with these pests, it will be thankfully received.

Cobourg, Ont.

M. F. K.

The importation of a few toads on to that piece of garden ground is the remedy indicated by nature. Toads are persistent devourers of slugs, bugs and the host of insect enemies which the vegetable world is heir to. The number of slimy abominations which a healthy toad will dispose of in the course of a week is astonishing—and no less wonderful is the activity which the ungainly brutes show in securing their fill. Make shelters for the toads in the daytime with stones or pieces of board.

Cabbage plants, etc., may be protected from slugs, by wrapping a strip of paper loosely around them at the time of planting, leaving the paper about an inch above the ground. This is some trouble, but will pay better than replanting.

A Hot-Bed in the House.

However cheap and economical the hot-bed made of heating manure may be for general use, the operator must have some considerable knowledge of the requirements necessary to success, in order to work it economically, especially in the early part of the season when both days and nights are cold, for then most constant attention must be given as to air and heat, so that the plants be shielded from cold wind or frost, else failure is certain.

To those who wish to raise only a few plants for the family garden, or, perhaps, strike cuttings for the flower garden, the plan which we now propose will, although it will be some expense at first, be found in the end economical.

Have a pan made (say 24x30 inches.) of strong sheet iron, with the sides somewhat flaring, and stiffened with pieces of thin board, or, better, buy an ordinary cast iron sink, and fix a faucet or plug in the bottom of the pipe, to draw off the water when necessary. Put this in a strong frame, made ornamental, if it can be afforded. Put also a shelf underneath the pan, at such a distance that the flame of a common flat-wicked kerosine lamp may just reach the pan. Into the pan fit a strong battened box, the bottom pierced with a number of holes to furnish drainage; and, with flaring sides to correspond with the sides of the boiler or hot water pan underneath, cover the bottom of the box with any old sleazy woollen cloth, to prevent the earth working through the holes in the bottom of the box. Have the water never so high as to touch the box; for the use of the water is simply to diffuse the heat regularly throughout the pan, or, as would be better, make a second pan of sheet iron within the first, against the sides and bottom of which the water may come.

From the lowest part of this earth pan a very small pipe must extend down through the drain hole of the water pan; this is to provide drainage for the earth pan. Any tinman will easily accommodate this small pipe, and still leave room for a small faucet besides, for draining the water pan. Have also a pipe sufficiently large to admit the end of a funnel, so that water may be poured in at the top to enable you conveniently to fill the water pan.

Now fit a frame to the earth pan as for any hot-bed, with sides sufficiently high so that when there are eight inches of earth therein, there will still be a distance of six inches between the earth and the pan, which is to be placed over all.

Thus you may have complete, and at a comparatively small expense, a case or hot-bed, wherein plants may be grown, or cuttings struck all through the winter if desired. These, when ready for potting, may be removed, and about the first of March, the soil may be sown with tomato, egg plants, pepper, and other seeds of tender plants, which will be large enough to plant out in a slight hot-bed, when all danger of freezing is over. They will furnish a pleasant recreation and study in winter, and this at the light daily expense of a few cents for oil, or, in cities where gas is used, all that will be required will be to carry a gas pipe under the tank, affix a burner, and the whole is complete. So, you may start seeds of verbena and other flowering plants early enough to be potted and kept growing, until ready for transplanting, and then follow with tender vegetable seeds for the garden as before directed.

If you have a water tank on your kitchen stove, it will not be necessary to keep the lamp burning during the day, since the water may be drawn off from the water pan once or twice a day, and refilled from the tank or boiler.

What you require is to keep the temperature of the bottom of the soil at about 80° during the day, and

if it sink to 60° or even 50° at night, no damage will occur. You may keep up any desired heat with your lamp during the night, and this with no change of water, except to add what may have been lost by evaporation.

It will be necessary that you have a soil thermometer, a simple bulb containing quicksilver, and stem, graduated from 32° to 120° Fahrenheit. Place the bulb in the earth next the bottom. Thus the thermometer should show a temperature of 80° for very tender plants, and say 65° or 70° for more hardy ones.

Now if you place this frame near a window where it may receive the light and heat of the sun, you can grow plants as healthy and as successfully as in a hot-bed or greenhouse. You will also soon learn the different requirements of various plants, which of itself is a most pleasant and profitable study, and besides have a sufficiency of ornamental plants and early vegetables for all ordinary purposes.—*Western Rural*.

Henderson's Early Summer Cabbage.

A reliable and good early variety of cabbage is a great desideratum to gardeners both for market and home use. Such a one, apparently, is the new variety of Early Summer cabbage illustrated on this page, now introduced by the well-known seedsmen, Peter Henderson & Co. They themselves are satisfied that it will rival, if not to some extent supersede, the Wakefield. The merit of this variety consists in its being the earliest of all large Cabbages, coming in but a few days after the Wakefield. It has another valuable peculiarity, of rarely or never bursting



open when ripe, so that if a crop cannot be used at once, it will not spoil, as is the case with most of the other early sorts. The introducers are confident that it will become a standard variety, either for market or private uses.

Onion Culture.

The best soil for the successful growth of the onion is one known as a clayey loam, not so heavy as to prevent being readily worked at all times, nor yet so light as to dry off and leave the onions with little or no moisture at just the time when they need it. The preparation of the soil consists in ploughing thoroughly and pulverizing well by harrowing repeatedly. Let the soil be broken up as early in the spring as the season will admit of, for this vegetable requires cool weather to grow rapidly, and the earlier you plant the better will the onions be in regard to size and quality. The reason many growers do not produce as fine onions as they should, is owing to late planting, much of the other spring work being done before the soil is prepared for the onion crop. But do not plant so early as to have the sets frosted, for frozen onions do not produce as fine bulbs as those which have not been pinched by Jack Frost.

We like planting on ridges much better than planting in beds, for we can cultivate with horse power, which is quite an item when from one to four or five acres are planted. The ridges are made by first drawing furrows, with a two-horse plough, about three and one-half feet apart, and putting a good sprinkling of well-rotted stable manure in these furrows just drawn. Two furrows are thrown on each of these rows of manure, making a ridge. This is done with a one-horse plough in the hands of a good ploughman, going twice around to level them up nicely and to put more fine earth on the top of the ridge. These ridges are now nicely levelled off with an iron rake until they are very little higher than the ground between them, and are about eight or ten inches wide on the top. No more ridges should be thrown up at a time than you can plant—throwing them up as you plant them—so as to have moist soil to put the bulbs in. This is an important item. We next stretch a line along on the top of the ridge, planting two rows of onions on each ridge, about six inches apart, the onions or sets being but about four inches apart in the rows.

As soon as the weeds commence to start, commence the work of cultivation by using an ordinary cultivator or hoe-harrow, running close enough to the onions not to disturb either the ridge or the onions. Having done this, take a narrow hoe, about four inches wide—a narrow prong hoe is

an excellent thing for the purpose—and hoe carefully and well between the rows on each ridge. We now let them remain a few days, after which we carefully sprinkle a moderate sprinkling of good guano or hen dung between the rows of onions on each ridge, doing this just before a rain, or else hoe it in. Two, or at the most three, applications of this kind generally bring the desired result. Cultivate well at all times, keeping the occasional weed tops pinched off, and hand-weed if at all necessary, which is generally the case.

As we have grown all the onions we raised from sets, which are produced from seed sown thinly in drills the previous year and then carefully wintered, we cannot give any practical directions of our own for growing from seed.

When the tops of the onions commence to wither and die, say about one or two inches at the extreme end, they have attained their growth. We then generally go over and bend or lay the tops over, together, as we have found them to keep much better that way, for they will not be so apt to take a second growth if a spell of wet weather comes on them. In harvesting this crop, choose a dry day, taking them as soon as they are gathered to some dry, airy and cool place, where they can be left until danger from frost is apprehended, when they should have the tops carefully rubbed off preparatory to removal to a dry and cool place, a dark place usually being advisable. At no time, especially immediately after removal from the field, should you put the onions in close heaps; the heaps should not be more than from two to three or four deep, or else they will heat and rot rapidly.

The culture of onions under favorable circumstances proves profitable year after year, the exceptions generally being due to neglect in some of the above particulars. The profits range anywhere from fifty to one hundred and fifty dollars per acre. In many cases more has been realized, but I wish to keep within bounds. The white or silver skin requires richer ground than either the red or the yellow (Danver's), but generally commands higher prices. We usually raise about an equal quantity of both the red and the white. There are many other kinds, but we rely on these, having tried them a long time in preference to others we have not had experience with.—*D. Z. Evans, in Ohio Farmer*.

The Wire-Worm.

The simplest and surest way to get rid of wire-worm is to plant potato-sets everywhere as a first crop, and take them up a week afterwards and cook them for poultry. By this very simple course of procedure any piece of ground may be completely cleared of wire-worm. As a matter of course, it requires judgment to carry it into effect. The wise way of proceeding is to trench and manure in the usual way, as if wire-worms were unknown. A lot of chats should be saved and kept in the dark until wanted, because if they get green the wire-worm will not take to them. When the ground is in a nice condition, dig in the potatoes quite thick, and in a week take them out and cook them. Then you may sow seeds, and go ahead, thoroughly satisfied that the ground is cleared of wire-worm. The cost and trouble amount to almost nothing, and it is a capital use for chats where they are not wanted for the pigs. Potatoes will rid any ground of wire-worm, and it will actually pay in the case of land newly broken up from pasture to grow potatoes in order to carry away the wire-worm. The pest soon passes away on land devoted to potatoes. They love the root, they are lifted with it, and very few of them get back to earth again.—*The Gardeners' Magazine*.

WHY CUCUMBERS ARE BITTER.—One of the causes gardeners give for cucumbers being bitter is that such are grown too slow; that in order to secure sweetness and crispness, they should be forced to grow as fast as possible.

TURNIPS.—Among the early white-fleshed sorts there is not much choice; but the Redtop Strap Leaf is probably as good as any. The Small Berlin or Tilton is the richest flavored of the early, yellow-fleshed varieties, but rather small, unless sown upon very strong soil. Robertson's Golden Ball is a larger sort, also of excellent quality. For a late winter variety we have never found any superior to the "Sweet German" for table use.—*R. N. Yorker*.

TO DESTROY CABBAGE LICE.—For years past the writer (a correspondent of the *Journal of the Farm*), has been in the practice of clearing this plant from an insect that infests it at an early stage of its growth, and often continues its ravages to a later date. These are little blue lice, which are so nearly the color of the plant, that it is sometimes difficult to fix their identity. This is, however, soon determined by the curling of the inside leaves, a considerable time previous to heading. The concave portions of these leaves being closely inspected, disclose often hundreds of the little insects, scarcely larger than the seed of the plant. An effectual exterminator of these has been used for a number of years, with unfailing success. It is simply this: Take some dry ashes in a pan, and while the dew is on the plant in the morning, sprinkle the ashes all over the plants, being careful to spread it on the inside of the curled leaves. Hickory ashes, or that of corn cobs, on account of the strength of the lye caused by the dew, is preferred. For a length of years this remedy has been tried with unfailing success. If well applied, it will not be necessary to perform the operation more than once.

The Breeder and Grazier.

The Horning of Cattle.

EDITOR CANADA FARMER:—Since difference of opinion is no crime, I propose to differ with those correspondents who say that the so-called "horning" of cattle is unnecessary and barbarous, and an operation fit to be classed with cutting off dogs' tails, cocks' combs, &c., &c., as per article on the subject in late numbers of the CANADA FARMER.

I propose to give a bit of my own experience in this line of business which I had but a short time ago. It was with three steers which I have, which had become rather unruly among other cattle, and I determined to (un) horn them by taking off a portion of their too formidable weapons to the extent of an inch or two of the sensitive part. And I did it in the following manner:—I secured the head of the steer to be operated upon between two posts in the stable by means of ropes, drawn tight. This gave me the advantage of open space in which to operate. Then with a sharp, common meat saw it was but the work of about half a minute to do the job for each steer.

I did not at that time have Mr. Alexander's opinion and experience as given in March number of CANADA FARMER to aid me, but I can say with him that it was "about feeding time, and they went to eating" as though nothing unusual had happened, and have continued to do so ever since; and to all appearances have no ill will toward me for the deed, but on the contrary appear better contented and more domesticated.

My opinion is similar to that of Mr. Alexander, that cattle will thrive better after a portion of their horns have been removed, whether they are unruly or not, as I have known quite a number of peaceable oxen and cows to have a horn knocked off by accident, and they improved and kept in better condition from that time.

How absurd the idea that man would go to all the trouble and expense of raising or buying an animal or animals of the horny kind and then would perform an operation on his stock that would invariably lessen the value and perhaps destroy the stock altogether, as the "Extensive Feeder" portrays in February number. But we consider it a little too thin. I admit that the opposite side of the question would serve well the purpose of a sensation with a certain class of the community; to illustrate which I know of nothing better than relate an incident or two that happened in Cincinnati a few years ago. The horse disease took all the horses off duty by actual sickness or the fear of it. This brought a great many oxen into the service to do city hauling. This was a new feature and not understood by all parties concerned, and especially by some of the police, who, seeing the oxen driven altogether by means of the whip, and to them apparent severity, had some of the drivers arrested for "cruelty to animals."

Another:—A party in the city having purchased a yoke of oxen to do hauling, failed to get them to work satisfactorily, and so complained to the seller that the oxen would not work. On enquiry into the case the seller concluded that the fault lay in the new driver, and so expressed himself to the buyer, who became quite indignant and said it was not the case, as he had "two niggers," one on each side, and then they would not work. Now, the fact of the business is, the police were mistaken in regard to the cruelty which they supposed to have been practised, and the new owner of the oxen in the other case did not know what it took to constitute an ox driver. W. F.

Pleasant Plains, Ohio.

OVER TWENTY THOUSAND COWS are kept for dairy purposes within a radius of twenty miles of Wheaton, Ill.

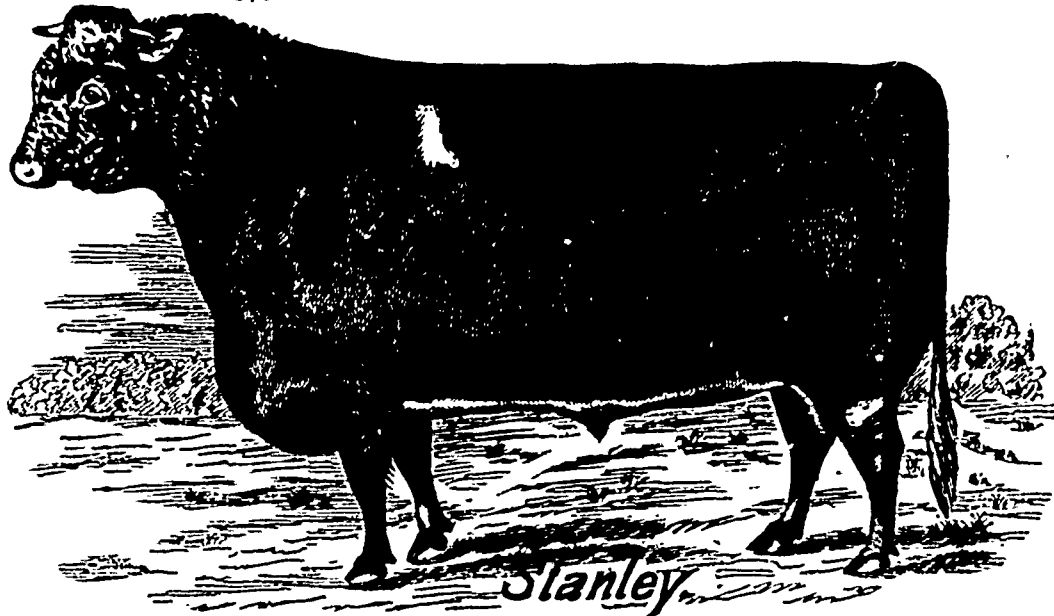
The Short-Horn Bull, "Stanley."

The bull, "Stanley," of which an illustration is given on this page, was bred by Mr Cruickshank, of Sittyton, near Aberdeen, Scotland. He was calved Nov. 22, 1870, and was imported in July, 1871. He is now the property of Mr. John Dryden, of Brooklin, Ont. He was got by Caesar Augustus, 25704,

Dam Sweet Violet.....	by Lord Stanley.....	(10454)
gr dam Violet.....	by Lord Bathurst.....	(13173)
g g gr dam Rosette.....	by Matadore.....	(11800)
g g gr dam China Rose.....	by Hudson.....	(9228)
g g g gr dam Carmine Rose.....	by Fairfax Royal.....	(6957)
g g g gr dam Red Rose.....	by Inkhorn.....	(6091)
g g g g gr dam Moes Rose.....	by Grazier.....	(1085)

He has obtained first prizes at the following exhibitions:—At Whithy Township in 1872, where he competed against three imported bulls; at Ontario County exhibition same year; and at the Provincial Exhibition same year; at the Whithy Township in 1874. He was not exhibited in 1873.

"Stanley" is a fair representative of the Cruickshank herd as indicated by his rotund form, thick flesh, and great substance. The well-known artist, J. R. Page, says of him:—"He is a credit to the herd from which he came, showing traces of the Booth cross (often used in the herd) about the head, the well filled crops, loins, and rumps, with deep flanks, brisket and round foreribs, uncommon good in heart, and a quiet temper."



Short-Horn Bull "STANLEY," belonging to MR. JOHN DRYDEN, Brooklin, Ont.

Flukes in Deer's Livers.

We alluded in our last issue to the fact that flukes had been found in the livers of deer, thus showing that the comparative exemption of our sheep from "rot," as compared with English flocks, was not owing to climatic influences rendering the existence of the fluke difficult on this continent. A correspondent of *Forest and Stream* gives evidence to show that the occurrence of the fluke in deer's livers is much more common than we had supposed. He says.—My observations, extending over a period of seven years, and the examination of certainly one hundred different specimens, has the following result relative to the deer of Northern Wisconsin and Michigan: From January to April, four out of every five deer killed contained from one to half a dozen parasites imbedded in the liver; while from July to November none were visible. Late in November I have discovered them, in an early state of development, when they would have escaped observation not specially directed to them. A month later they could scarcely fail to attract the notice of any one dressing a deer. In February they present the appearance of a large ulcer about one inch in diameter, and the flesh about them is discolored and apparently much decayed. I never noticed that their presence was influenced by age or sex, but found them equally in all specimens during the winter and spring. I have frequently conversed with professional hunters on this subject, and the majority held the opinion that our deer were always affected by these parasites (worms) in winter and spring, but recover from them in early summer. My old guide—Hammil, of Green Bay, a hunter of great experience and a minute observer—indorsed this theory.

legs, and with all possible tenderness soothing and facilitating the passing of the head with his fingers, rather than forcibly extricating it, the particular attention being given to these points. This may be effected by passing the oiled finger up the rectum, until he feels the back of the lamb's head, and then urging it forwards at the same time that he gently pulls the legs. Sometimes the head is sufficiently advanced, but the legs are too backward. In this case, the head must be gently pushed back, and the hand being well oiled, must be introduced into the vagina, and applied to the legs, so as to place them in their natural position, equal with the head.

Should the fore feet, on the other hand, protrude, they must in like manner be returned, and the same assistance be given to advance the head. If the hinder quarters present themselves first, the hand must be applied to get hold of both the hind legs together, and draw them gently but firmly; the lamb may often be easily removed in this position. It is no uncommon occurrence to find the head of the lamb protruding, and much swollen; but still, by patience and gentle manipulation, it may be gradually brought forward; or even nature, not easily interfered with, will complete her work, if the pelvis is not very much deformed. Should, however, the strength of the mother be rapidly wasting, the head may be taken away, and then the operator, pushing back the lamb, may introduce his hand, and taking hold of the fore legs, effect the delivery. It also often happens that the legs are thrust out to the shoulder, and from the throes of the ewe, it is not possible to replace them so as to get the head of the lamb. By partially skinning the legs, they may be dis-

Care of Ewes at Lambing Time.

No good shepherd needs urging upon him the necessity of gentleness in the handling of his breeding ewes. Generally, all the care that is wanted at lambing time, is the isolation of the breeding ewes from the rest of the flock, a warm, sheltered location, and judgment in the selection of the food served out to them. Dogs should be kept away. The ewes should not be too closely confined, as some amount of exercise is essential to safe parturition. A writer in the *Prairie Farmer* gives minute directions to be observed by the attendant. He directs the breeder, on observing the premonitory symptoms of lambing in those ewes he knows will lamb first—these symptoms are, enlargement and reddening of the parts under the tail, drooping of the flanks, patting the ground with the feet, and desire for separation from their companions—to place them, of an afternoon, within the enclosed lambing ground, and provide them with cut turnips. The attendant must not be led, by the appearance of uneasiness and pain, to interfere prematurely; he must watch the ewe closely, and so long as she rises at his approach, he may be assured that, whatever uneasiness she may exhibit, all is well. Much uneasiness is generally apparent; she will repeatedly lie down, and rise again with seeming distress. If this occurs when driving her to fold, he must be very cautious and gentle in urging her. These symptoms ought to be continued for two or three hours, or even more, before he feels imperatively called on

to interfere, except the lamb is in such a position as to warrant fears of losing it. In cold weather particularly, the labor is likely to be protracted. Should the ewe appear exhausted, and gradually sinking under her labor it will be right to give her some oatmeal gruel with a little linseed, in the proportion of a spoonful of the latter to two of the former.

When the ewe feels that she is unable, of herself, to expel the lamb, she will quietly submit to the attendant's assistance. In giving her this assistance, his first duty is to ascertain whether the presentation is natural. The natural presentation is with the muzzle foremost, and a foot on each side of it. Should all be right in this respect, he must proceed to disengage the lamb, first very gently drawing down the

united from the shoulder joint, there will then be room for the introduction of the hand, and by laying hold of the head, the ewe can be delivered.

The exact moment for rendering assistance to a lambing ewe can only be known by experience; it is necessary to watch and wait, for a hasty parturition often superinduces inflammation, if not of the womb, of the external parts of the ewe. When assistance should be rendered, the ewe is taken hold of as she lies, and laid gently over upon the ground on her right side, with her head up the hill, where the ground has an inclination. In aiding the ewe, it should always be remembered that the action of her hands must be made simultaneously with the straining of the ewe, only to assist her, and keep good what is obtained at each strain, and not to tear the lamb from her prematurely by force. Whenever the lamb's head is clear, the attendant, seizing the upper part of the neck behind the head with his left hand, the right hand still holding the legs, he pulls out the body with ease. The lamb is then placed at the ewe's head for her to lick and recognize, which she will instantly do, if her labor has not been severe, but if so, she will likely become sick, and be careless of the lamb as long as the sickness continues, which is evinced by quick, oppressed breathing. If the pains have been sharp, and this her first lamb, and she is not overcome by sickness, the ewe may probably start to her feet, and run away from the lamb. The attempt at skidding must be prevented, and the end of the tail of the lamb put into her mouth, to make her notice it.

Care of Young Calves.

Farmers should raise enough of the best calves, or calves from their best cows, to keep their stock fully up. Endeavor to get good strains of blood into the herd by using a thoroughbred bull. Never use a half or quarter-blood bull if it is possible to obtain a full-blood. A cow before calving should be placed in a warm, dry box stall for the comfort of the cow and the safety of the calf. The practice of allowing a cow to have a calf while confined in the stanchions cannot be too strongly deprecated. Even if it is not desirable to raise the calf, it is an unnecessary cruelty to keep the cow confined. The practice is doubly unnecessary and cruel when the calf is to be raised. If the calf comes early in the night, it is apt to be prostrate in water and filth until morning, when it is chilled through, and no matter how fine a calf it might have been, it is a mercy to kill it.

Therefore, presuming that the cow is in a comfortable and convenient place, as soon as possible after the calf comes, it should be rubbed perfectly dry. Too many precautions cannot be taken to prevent the calf from becoming chilled, and it is more apt to become chilled while wet. The calf should be fed, as soon as possible after birth, with milk freshly drawn from its mother, and should have the whole of its mother's milk for at least a week or ten days before it receives any skimmed milk. The change from new to skimmed milk should be gradual. Begin by mixing a little skimmed milk with the new milk. Feed regularly three times a day all the calf will take. Keep in a clean, dry pen, well littered with plenty of clean straw, to insure cleanliness and good health. Remember that if you sight the calf now, when it becomes a cow, it will sight you.—*Cor. Country Gentleman.*

An Experiment in Feeding.

The following experiment in feeding hogs has been made at the Illinois Industrial University, under the charge of Mr. Lawrence, head farmer.

Two Poland Chinas and two Berkshires, a sow and barrow of each, were put in separate pens, Oct. 1st, 1874. Weight, per pair: Polands, 185 pounds; Berkshires, 183 pounds; and were fed to Dec., 1, 1874, two months, with the following results. Weight per pair; Polands, 320 pounds; weight per pair, Berkshires, 230 pounds. Corn consumed in 61 days; Polands, 8.13 bushels, Berkshires, 3.89. Polands, on 8.13 bushels, made 145 pounds; Berkshires, on 3.89 bushels, made 48 pounds. Polands, 1 bushel of corn made 17.83 pounds, gross; Berkshires, 1 bushel of corn made 12.34 pounds gross. Polands farrowed May 8, 1874, Berkshires farrowed April 15, 1874.

The pigs were fed on corn only, and of the crop of 1874, which had been gathered and cribbed Oct. 1, and was of an average quality for the season, 50 pounds in the ear having been taken for a bushel, that being the market rate at the time. An equal weight of corn was put in separate bins. At the end of two months the Polands had consumed the whole of theirs; the Berkshires less than one-half; and to determine the amount they had eaten, the remainder was weighed back at the rate of 75 pounds per bushel. The Poland barrow was killed Dec. 1st, and weighed alive 175 lbs. at 207 days old, and dressed 134 lbs., shrinking 41 lbs. or 23.4 per cent.

The object of this experiment, to be followed by others

of a similar character, was to help to determine how many pounds of pork a bushel of corn would make, and also get at the relative value for feeding purposes of pigs of different ages and breeds.

It should in justice be stated that one of the Berkshires did not prove to be a good feeder; and as respects the Polands, that as they showed a good deal of the characteristics of Berkshires, they have been tintured with that blood. That they pass in this neighborhood as Poland-Chinas, is all that is known of them.

While it is the province of persons in charge of Experiments, to state facts only, perhaps it may be well to caution the reader against drawing definite final conclusions, until this experiment, and others as well, have been repeated and extended.—*Prairie Farmer.*

Economic Horse Management.

At a recent meeting of the Newcastle-on-Tyne Farmers' Club, Mr. Hunting, V. S., read an exhaustive paper on the management of horses. We give the commencement of it below, and shall re-produce a portion of it from number to number, until completed:

Economic horse management consists in obtaining the greatest amount of work at the smallest cost; but here, as in every other department, true economy depends, not upon niggardliness, but upon careful selection and well-judged method. Good food must accompany good work. Neither must be disproportionate. It is difficult to say whether too much or too little of either is the worst economy. But good food and good work are not absolute terms, capable of mathematical definition. What is excess of work for one horse, is not for another. What is excess of food for one horse, may be insufficient for another; or again, the food required by a horse doing moderate work is insufficient for the same horse doing hard work.

There is still another difficulty—viz., that equal weights of food of equal market value may differ indefinitely in feeding value. These few statements will show that careful selection of foods and well-judged method in proportioning them to the work done are absolutely essential to economic management, and this skill and judgment require some scientific knowledge, and some practical experience not always thought necessary in the horse manager of an establishment. My knowledge of the subject has only been obtained by long experience, by freely accepting the work of others, and by submitting each theory or statement likely to be of value to a practical test. The subject is far from exhausted, but I think that any further development must follow the lines we have laid down. Tabular statements of the cost of feeding show absolutely nothing, save by comparison with others, and a comprehensive estimate should include not only the cost of food, but the cost of horse flesh and the amount of work done. By keeping too many horses to do a certain amount of work, the bill for feeding can be made to look economical. By stinting the food an appearance of economy may be effected on paper, but the condition of the horses and the duration of their lives would soon dispel the illusion. Both these explanations have been offered to account for the statements of economy embodied in my annual reports to the various collieries at which I have charge. I quite allow their force, when true, but I shall shew to-day that neither by accident nor design have I adopted either.

Economic horse management requires care in the conducting of the smallest details. From the purchase of the animal onwards, every step must harmonize and be subservient to the general object—economy. I shall not detain you with an account of what I consider the necessary points of a horse for the various situations he has to fulfil, but simply say that the best animal fit for the work is the most economical. Age and soundness should always be attended to. There is one point upon which I venture to dwell, because it is often neglected, and then always entails more or less loss. Pit horses are probably the hardest worked animals in the kingdom, and hard work cannot be economically done by horses unless in condition. Every hunting man would cry shame on the folly displayed by a person taking a horse from grass or the dealer's stable and attempting to push it through a day with hounds. Pit work is little less severe than fox-hunting, and yet horses with no pretence to condition are expected to go to it at once and to continue at work daily. The result is that if these horses are not soon entirely knocked-up, they pass a period of two or three months during which enormous feeding is barely able to keep them at work, and from which many emerge with systems so damaged as never to recover the strength and tone necessary to produce the greatest amount of work. Their frequent and repeated bodily exhaustions render them prone to disease, to sprained limbs and to falls, which, in pits, occasionally end fatally.

As all collieries require not only cart, but farm horses, this state of things might be easily avoided by passing all new horses—not in condition—through one or other of these departments. The usual practice is to stock the carts with worn-out or partially disabled pitters, or with those animals which are guilty of kicking or jibbing. Instead of these departments being used as hospitals, economy would be best served by their acting as nurseries. In whatever way effected, certain it is that true economy requires horses to be in fair condition before being put to pit work. In practice, circumstances frequently occur in

which we are obliged to place horses in the pit irrespective of their condition. We must then endeavour to conserve their strength as much as possible until food and work have produced that muscular tone we call condition.

In all large establishments diseases and accidents cause horses to be at times "off-work." When the number of animals kept is just equal to the amount of work done, this event necessitates either the loss of work or excess of labor for the other horses. Now, excess of labor invariably means loss. To make twelve horses do the work of fourteen is certainly not economy. First we lose condition, then health, and lastly life, and this follows unavoidably. It may not be so immediate as to attract the notice of the unskilled, but it is so far from remote as to surely affect the cost of horses throughout the year. This cause of loss is entailed in all establishments where spare animals are denied; one spare animal—horse or pony, as may be necessary—is required for every twenty on the colliery, and it will not be kept idle. In fact, what with lameness and illness among the others, it will be nearly constantly at work.

Having thus got a fair stud properly proportioned to the work, our next task is to keep them as economically as possible. Let me repeat—this requires that they be kept in condition. What is this "condition" upon which I insist so strongly? It is that state of the system in which nerve and muscle are braced to their fullest extent; that state in which the animal body is capable of performing its greatest amount of work, and in which alone it is capable of sustaining prolonged efforts. If we look upon a horse simply as a machine for work, this state is the only one in which we can use him for hard work economically. With it we obtain the greatest amount of work of which his muscles are capable. Without it we have, so to speak, a certain amount of mechanism lying idle, i.e., muscular structure useless for want of tone. Yet we must not abuse this state, which depends entirely upon a proper balance, and enter a state in which economy is no longer attainable.

There are two events necessary to produce condition in horses—work and food—or rather, I should say, hard work and high feeding. The former we never lack in collieries, and the latter can easily be attained, if cost is no object. A sufficiency of oats and hay with plenty of work will produce condition, but at a cost we consider most extravagant. But high feeding can be economically attained, and we shall shew how horses may be kept in the highest condition at a cost very much below what is usually incurred for animals doing only light work.

There are three events which render high feeding economical: 1st, the selection of the cheapest but best food; 2nd, giving that food in a form most favorable to digestion; 3rd, the prevention of waste. The selection of the cheapest and best food is, of course, a matter to be settled by experiment. In this way the results I shall lay before you have been arrived at; but as I wish not only my conclusions accepted, but the plan understood, I shall ask you to follow me through an outline of the rudiments of feeding, ignorance of which reduces even the most extensive and careful practice to the blind rule of thumb.

(To be continued.)

A VERMONT sheep-breeder recommends a tablespoonful of sulphur to two quarts of salt as a feed to sheep that will exterminate ticks. Feed this twice a month.

JOSEPH HARRIS gives this axiom:—Butter and tallow are not economical foods for cows and sheep. When we let an animal grow thin in winter, we are feeding fat and flesh. It is injurious to the animal and a great loss to us.

AN ENGLISH FARMER who has "used wheat as food for his horses for some time," tells the *Mark Lane Express* that he allows "ninety pounds per horse for the week, soaked in a cistern for forty-eight hours, in cold water. The water is then run off, and the grain allowed to remain twenty-four hours to create fermentation."

A BREEDING MULE.—It is now well established that mules dosometimes produce young. The instances are very rare, but some are well authenticated. In the famous acclimatizing garden near Paris there is a mare mule which has had two foals sired by an Arabian stallion, and is now in foal by a jack. The two foals are living and much resemble the sire.

GAIN IN WEIGHT OF CATTLE.—A Canadian farmer says: that, in order to ascertain the gain in weight of growing cattle, he tried an experiment as follows. He weighed a Short-horn bull calf on the 12th of April, 1874, when he was just 4 months old, and found his weight to be 503 lbs. May 12th he weighed 593 lbs; June 12th 703 lbs; July 12th, 801 lbs.; August 12th, 886 lbs., and September 12th, 966 lbs.; a total gain in five months of 463 lbs., or 92½ lbs. per month.

GRADE HOLSTEINS FOR BEEF.—A Syracuse correspondent of the *Country Gentleman* writes:—Hon. C. B. Sedgewick of this place sold a heifer calf, eight months and twelve days old, to Holden & Wood, butchers in this city, which dressed as follows: meat, 552 pounds; hide, 63; rough tallow, 40; a total of 655 pounds. Its live weight was 875 pounds, and the beef was very fine and well matured. The heifer was half Holstein and Half Short-Horn, from pure-bred parents on both sides.

Veterinary.

Lampas.

EDITOR CANADA FARMER.—Will you give me the treatment for lampas.

Goderich, Ont.

J. A. R.

Lampas is an inflammation of the gums and bars of the mouth. Young horses that are cutting their teeth are liable to it. The treatment is to let the swelling in duce a slight bleeding; and if the swelling do not subside, lance again. Be careful not to cut behind the third bar, or you might sever the artery.

Cauterizing with a hot iron, as is sometimes practiced, is a bad remedy which may be called atrocious.

Bots in Horses.

The correspondent who asked last month for a remedy for bots in horses, and others of our readers who have horses similarly affected are requested to try the remedy mentioned below and report, if successful. It is from a correspondent of the United States Department of Agriculture. He says:—It appears from remarks by different writers that none know of any certain remedy. I know of a remedy, that is safe and certain, discovered in the following way:—About thirty years ago, a friend lost by bots a very fine horse. He took from the stomach of the dead horse about a gill of bots and brought them to my office to experiment upon. He made preparations of every remedy he had heard of, and put some of them into each. Most had no effect a few affected them slightly but sage-tea more than anything else; that killed them in fifteen hours. He concluded he would kill them by putting them into nitric acid; but it had no more effect on them than water; the third day they were as lively as when put in. A bunch of tansy was growing by my office. He took a handful of that, bruised it, added a little water squeezed out the juice, and put some in; they were dead in one minute. Since then I have had it given to every horse I have seen affected with bots, and have never known it to fail of giving entire relief. My friend had another horse affected with bots, several years later. He gave him the tansy in the morning and a dose of salts in the evening; the next morning he took up from the excretions three half-pints of bots.

Hoven or Bloat in Cattle.

EDITOR CANADA FARMER.—As you are always pleased to help your readers in any way, I want to know from you, or any of your readers, what is the best method of treating bloated cattle without the use of the knife. I have been frequently called upon this winter to assist in the removing of wind from the stomachs of cattle. I should like some of your readers to give their experience. One steer recovered after being chased around the yard for a while; others by starving for a time and giving them salts. All recovered, but great care had to be used in feeding afterward.

CONSTANT READER.

Puslinch, Ont.

Hoven, or bloat in cattle, is due to the generation of gas within the rumen or paunch, and is a disease that requires immediate relief. An excellent remedy is spirits of turpentine, two ounces, and raw linseed oil, one pint, or sulphuric ether may be used in place of the turpentine. Many other remedies are recommended—such as hyposulphite of soda, and some of the preparations of ammonia.

In cases where the distension is very great, and when the symptoms are alarming, it is necessary to afford relief mechanically, which may be done by passing a hollow probog into the rumen or it may be necessary to puncture. The operation of puncturing may be done with an ordinary pocket or penknife, but the proper instrument is the trochar or canula.

The puncture should be made on the left side, at a point equidistant from the last rib, the transverse processes of the lumbar vertebrae and the point of the haunch. In inserting the trochar, incline the point downwards.

Typhoid Fever in Pigs.

The London Field has the following exhaustive article on typhoid fever in pigs:

The sudden appearance of the disease which is commonly known as the "red disease," or "the purples," among pigs in some parts of Somerset, has led to inquiries as to the nature of the affection and the probable danger of its extensive spread. Answers to these questions can be given without difficulty. First, as to the nature of the disease, it will be sufficient for the present to remark that it closely resembles typhoid fever in man. Next, it may safely be affirmed that the disease does not manifest any tendency to spread extensively among pigs, notwithstanding its contagious character. About fifteen years have passed since typhoid fever was first recognised as a disease of pigs, and since the date of the discovery of the first outbreak, the affection has appeared in various parts of the kingdom. In Ireland, in some districts, it is more prevalent than in England, and on the Continent it is still more common; but it has not, at least of late years, assumed an epizootic form, as foot-and-mouth disease does.

The causes of typhoid fever are not easily defined. Very often an outbreak of the disease is traced to the purchase of pigs at a fair or market, and then the reasonable conclusion is that the newly purchased animals were infected at the time. But in other instances no such cause exists, and the origin of the disease in a lot of pigs which have not, so far as can be ascertained, been exposed to the contagion, is a problem which is not easy of solution.

Outbreaks of typhoid fever in man are generally sufficiently serious to call for close investigation, the results of which are now and then rather startling. Several times lately the disease has been traced to the use of milk from dairies, some of the inmates of which have suffered from the affection. Contamination of water with sewage matter, and the inhalation of air containing organic impurities, are the chief causes to which different observers attribute the malady.

A very important question relative to the cause of typhoid fever in man and the lower animals is yet undetermined. Some authorities contend that all kinds of organic impurities are capable of generating the disease, while others adopt the view, which has been ably argued by Dr. Budd, of the existence of a typhoid germ, which is indispensable to the production of the disease. According to Dr. Budd's idea the germ of typhoid fever is conveyed in sewage matter, either liquid or gaseous, and thus may be introduced into the system through the agency of food or atmosphere. Associated with this notion is an uncomfortable impression of the wide diffusion of typhoid germs; but a source of consolation exists in the fact that the seed must find a favorable soil before it can germinate. In other words, the system must be susceptible to the influence of the typhoid poison, or it will fall on barren ground.

The general view of the origin of typhoid fever is more comprehensive than the one which Dr. Budd has so strenuously advocated. Outbreaks of the disease have so frequently occurred at points remote from any centre of infection, that it has become impossible to escape the conclusion that organic impurities in the air which we breathe, or in the water and food of which we partake, are sufficient to cause the disease without the presence of the specific poison.

Admitting that contaminated air and water will under certain conditions cause typhoid fever in man, there is no ground for doubting that the same result will follow the action of the same causes on the lower animals providing that they are susceptible to the disease. It would seem however, that the tendency to the development of the typhoid poison only exists in pigs, and in them very rarely after the age of six or seven months. Cases of the disease in these animals after the age of one year are exceedingly rare. From birth up to the age of six months the system appears to be remarkably liable to the influence of the poison, after that age the susceptibility becomes gradually less, until it altogether ceases.

The comparative infrequency of typhoid fever in pigs is in all probability due to the circumstance that the susceptibility is limited to a short period in the life of the animal; otherwise considering the unsanitary conditions to which pigs, beyond all other farm stock, are commonly exposed, we might reasonably expect a much higher degree of prevalence of the disease.

Symptoms of typhoid fever are sufficiently characteristic to be recognised by the practical observer, who may not possess any technical knowledge of the affection. Generally attention is called to the existence of the disease by the death of one of the animals, and it is then noticed that the pig is either covered with red spots or is completely purple all over the body. An examination of the other animals will lead to the discovery of the signs of the disease in various stages. Some of the pigs will present merely a common sign of illness—dullness and loss of appetite; others will be shivering; others, again, will be found sitting on their haunches and incapable of using their hind extremities. Red patches will be seen on the skin in dif-

ferent parts of the body, and particularly behind the ears. In white pigs the red spots are of course very apparent; and we can add, in answer to a very frequent question as to how they are to be seen when the disease attacks a black pig, that the dark color of the surface does not materially mask the redness of those parts on which the eruption occurs.

Recovery from typhoid fever is very rare. Almost as soon as the characteristic symptoms are well developed, the animal sinks from exhaustion and dies; the carcass rapidly becomes putrid, and gives off a most powerful stench. Treatment of the diseased animals is not to be recommended; in fact, a prompt application of the stamping-out system is the only rational method of dealing with a disease of so virulent a character. Slaughter of all the diseased animals, and burial of the carcasses, is the first step; and a thorough cleansing and disinfection of the places which the animals have occupied the next. Chloride of lime is the most effectual disinfectant, and it can always be obtained. Common lime is the best dressing for the floors of sheds and styes, and also for the land on which the diseased pigs have been fed; and, as a common-sense precaution, the farmer will avoid placing animals in the infected places for some time.

WHEAT AND ABORTING MARES.—A writer in the *Prairie Farmer* cites a good number of cases where mares in foal have aborted. These had been fed with wheat steeped or soaked, varying in quantity from less than a gallon to a gallon.

MANGE IN DOGS.—First, have the dog well washed with castile soap-suds in the morning; rub dry. At night apply well the following:—Tram or tanners' oil, or kerosene, 1 qt.; spirits turpentine, 2 wine-glassfuls; sulphur, 1 lb.; mix well. Keep the dog in a dry place, and wash and apply as above, three times every fourth day.

TO PREVENT ABORTION IN COWS.—Dr. McClure's remedy to prevent abortion in cows by giving tone and strength to the system, is: Powdered sulphate of iron, 2 drachms; ginger and gentian each half an ounce; mix, and give one dose night and morning for a week, then delay a week and commence again. This remedy has been quite successful around Philadelphia.

COSTIVE SOWS.—A brood sow, when carrying her young, is very apt to be costive, and especially a few days before she farrows, and a few days after she has farrowed. This brings on milk fever, and sometimes causes a sow to eat her young. To prevent this, and cause a natural flow of milk, the best thing I ever tried is to give a tablespoonful of Epsom salts in some slops once a day, for three days in succession, the last days before she farrows.

LIME FOR SPLENIC DISEASES.—A French gentleman, M. de Launay, has succeeded in banishing from his farm at Courcelles a form of splenic disease which is fatal to cattle and sheep, by giving the animals free access to carbonate of lime. He had observed that the cattle stabled next to the walls of the shed were in the habit of licking the whitewash, and that they did not suffer. He placed chalk in a position accessible to the rest, and they too were not attacked. Certain sheep which were then isolated from the rest and deprived of chalk were attacked by the splenic disease as formerly.

CARBOLIC ACID, SO-CALLED.—This salt and its various preparations is more or less poisonous, and in my opinion a dangerous remedy in any form of parasite infesting animal life. I am convinced, from experiments and practical tests, that no form of so-called carbolic acid can be applied sufficiently strong to kill the parasite, which would not be in danger of injuring the animal to which applied, and besides, we have several good remedies, one of which is arsenic acid (arsenic). This is a deadly poison, but in the form of two drams to one quart of water, while it is one of the best destroyers of lice, it cannot be licked off in sufficient quantity to do the least harm; neither is there any fear, in this preparation, of absorption through the pores of the skin. A horse or cow might lick off to the amount of half a dram and no serious results follow, but not so in any quantity with carbolic acid.—*Cor. Western Rural.*

INCONTINENCE OF URINE IN A HORSE.—A severe strain of the lumbar region sometimes causes paralysis of the closing muscles of the urethra. These means would be most likely to effect a change. Over the loins, the hairs should be clipped short, say about four square inches on each side of the spinal column; and into this space should be applied a blister, composed of cantharides, half an ounce; spirits of turpentine, two drachms; hog's lard, 2 ounces. Mix, and divide between the two sides, and rub it well into the skin. Next day, and every day, for a week, apply once daily, on top of the blister, a coat of lard. Use frequent cold water injections into the rectum. Give the animal, internally, once daily, a ball composed of powdered cantharides, ten grains, powdered digitalis, one drachm; soft soap, three drachms. Continue this for one week, and renew, after seven days, during another week. The animal should have liberty, in a good, well-littered box stall, and be fed on good, nutritive food. He should be kept quiet, and, of course, not be worked for a month or two. After a fortnight, the blister may be renewed over the loins, or when the scabs shall have fallen off. If he is sore, the shoes should be removed.—*Prairie Farmer.*

The Poultry Yard.

Scientific Principles of Mating Hamburgs, Polish and French Fowls.

To breed Hamburgs requires care and attention. No other breed of fancy fowls has, perhaps, taxed the ingenuity of the breeder to a greater degree and, even yet, all breeders do not pursue the same general course in mating their stock.

SILVER SPANGLED HAMBURGH cocks should possess good comb and earlobes, with as much spangling in back and saddle as possible, good hackles and clear tail, but not hen-feathered. Such cocks should be put to hens, the best in marking and color that can be found, avoiding all or any great faults, such as coarse comb, or smudgy markings.

GOLDEN SPANGLED HAMBURGHIS.—With these a somewhat different course should be pursued. The cock should be selected from a good pullet-breeding strain, and rather darker in color and coarser about the head than in good exhibition birds and mated to hens similar to the Silvers in marking, but of course of the Golden line.

IN SILVER PENCILLED varieties, good breeders, says Wright, make up cockerel and pullet pens. For the cockerel pen they match a good show bird with hens much too light in the pencilling for exhibition, with markings distinct, but not heavy enough. For a pullet pen, the very best hens mated with cocks or cockerels, with perfectly black tails, and black about the body. But the objection to this mating is, that neither strain can be depended on to breed in any other way, and many of the pullets hatched, even if they do not show the approach to black spangling, are apt to present a coarse appearance from the markings being too broad and heavy, which all the best breeders have been doing all they can to banish. But "a cock from a reliable strain with properly laced sickles, slightly perceptible bars, which show good dark pencilling underneath on examination, and plenty of black in their secondary feathers, will breed pullets all that can be desired, as well as reproducing his own likeness in the cockerels." Other breeders of this variety choose a cock from a strain ascertained to be thoroughly well pencilled. Tail perfectly black, sickles also black except the clear white edging, which on no account should be grey; bars on wing perceptible but slight, and not too plainly visible, though the wing coverts which form it must be darkly pencilled, mated with hens as previously described, produce excellent chickens.

In breeding **GOLDEN PENCILLED HAMBURGHIS,** the same markings and pencillings as in the silver pencilled, allowing for the difference in ground color, are to be sought exactly in the feathers, therefore the same marks as to colors in mating will apply.

BLACK HAMBURGHIS, like Black Spanish, require no degree of shade in marking, except brilliancy of lustre; combs and faces are therefore the essential points to be considered. Birds with ill shaped combs, white faces, legginess, red hackles and saddles, ought not to be bred from. In this variety as in others some breeders have cockerel and pullet pens. Pens to produce cockerels only. The cocks should have perfect combs, good red faces free from white, round white earlobes free from red, hackle and saddle perfectly free from red, short legs, broad back and chest; want of color is not of so much consequence. For a pullet pen, a cock must have as many of the above qualifications as can be found united, and with very brilliant color. To breed good pullets a cock must have color, and therefore a reddish hackled cock, if good in other respects, is preferable to a dull colored one. Lustrous pullets may be bred from hens with little color, if mated with a bright cock, but never from a dull colored cock, no matter how lustrous the hens with him may be.

The science of mating colors in the pencilled and spangled Hamburgs, is to re-produce in their offspring clear and distinct colors without mousing in the feathers, the lacing and spangling to be clear and well defined, which will not be, if the parents have present in themselves the faults alluded to; hence the great necessity of selecting none but such birds as are entirely free from such objectionable points. In the black variety, we have already in a previous paper noticed, how liable black fowls are, when

mated with others of the same variety, to throw red—and this is the point to be avoided in Black Hamburgs.

GOLD AND SILVER SPANGLED POLISH.—In all crested fowls the most essential point to reproduce is crest, all other points, though important in themselves, are secondary. It is important to know that any deficiency in crests in the parent stock, is sure to be transmitted to the progeny, and however good a bird may be in lacing, if short in crest, it is useless for exhibition. The scientific course adopted in breeding the two varieties of gold and silver polish is similar. Birds for breeding should be chosen without any sign of comb, as this one desirable point is rather apt to appear where not wished. Darkly marked birds should be chosen for the stock pen, as there is always a tendency to breed lighter. The style of marking should be heavy and deep in character, but sharp and clearly cut. Birds with deformities, such as crooked beak or round or crooked backs should not be bred from. Some breeders of this variety prefer putting young cocks with hens.

WHITE CRESTED BLACK POLISH.—As in the other varieties of Polish so also in this, crests are the most important feature, and should therefore be the first point of consideration with the breeder. When possible, it is best to put together birds whose crests are ample in every respect, as this class of fowls usually breed with great regularity, when the parent birds are well chosen; but the selection of the cock is the most important feature, and therefore, if both parent birds are not perfect in crest, it is better that the hen should be the one deficient, as a cock with perfect crest, when mated with a hen with a comparatively poor crest, produces chickens with better top-knots, than can be obtained, when the hen is all that can be desired, but the brood cock comparatively inferior in crest. It is somewhat remarkable that Polish fowls are peculiarly subject to malformations, such as wry-tail, curved in the spine &c., arising no doubt from constitutional defect caused by too close breeding. At most the number of breeders of Polish fowls are limited and interchange of breeding stock seldom takes place. This fact it establishes however, the fixity of certain points which breed true in the progeny. Care should be taken that no birds with malformations such as alluded to, be bred from.

It is not many years since French breeds of poultry were introduced into Canada, and such as have engaged in breeding them, have, we believe, found them very desirable, more especially the **HOUDAN.** In all the different breeds there is one point common, and that is they are most delicious table fowl. There is little doubt but it was by a system of judicious crossing, the Polish fowl being the foundation, and subsequent selection, in the way of founding new breeds that all the French breeds, were established. The Houdan is a crested fowl like the Polish, so is the Crèvecoeur with its large crest and which in all other respects resembles the Polish, but increased in size; constitutional delicacy characterises all the varieties, with absence of the incubating instinct.

HOUDANS.—Muffs or beards and the fifth toe,—although when first introduced into England the fifth toe was very uncertain, and also occasional birds without muffs or beards would appear—are the essential points in breeding Houdans. The fifth toe having now become a fixity, it is as essential in the Houdan as in the Dorking; no bird without it would have the slightest chance of a prize in the show pen. To breed muffs and the fifth toe are therefore the essentials. Houdan hens, if light in color, should be put with a dark cock or cockerel, but some breeders prefer mating dark hens with a cock or cockerel rather lighter in color. The crest is said to come with the hen, therefore it is of greater consequence to select for breeding, large-crested hens than cocks.

CREVECOEURS.—A crested fowl, black all over, although white occasionally appears in crest, which should be bred out, as it is objectionable. Purity of black color, full sized and solid looking crests, fine frame and square development should always be looked for in stock birds, as these are the chief points to be sought for; both parents ought to possess them in the highest degree to secure good chickens. Two-horned combs are preferable to antlers and should therefore be sought for in the breeding stock.

LA FLECHE, somewhat resembles the Spanish in type. The fancy points to be sought for in breeding stock are pure white earlobes, absence of crest, neat and small combs and hard glossy plumage, combined with fine sturdy

frames, and as strong a constitution as possible, and breeding from none but fully matured birds; these are the essential points for a breeder to consider when choosing his breeding stock.

SCURVY LEGS.—The following is a good cure for scurvy legs among fowl:—Take sulphur, two ounces; charcoal, pulverized, one-fourth ounce; train oil, enough to form a paste. Apply with the hand, by rubbing well in. Allow it to remain for three days; then wash off in mild weather, with good soapsuds, and repeat the dressing as often as it is necessary.

TO GET RID OF LICE.—Cleanliness is the first thing, and it will generally prevent the appearance of lice. Do not have too many fowl in one building. If lice should appear, the best application is, train or other oil one pint, arsenic one drachm, well incorporated, and rubbed under the wings a little at a time; also upon the back and head. One or two applications will be sufficient to kill all lice. Then wash off the filth with warm soapsuds.

ROUF. It is said that this formidable disease has been successfully treated by the following method:—If any of the fowls breathe hard, snap their heads, or run at the nostrils, give a teaspoonful of castor oil. If their nostrils are stopped up and they make a whistling sound or open their mouths to breathe, make strong suds of castile soap and luke-warm water, and with a small sponge wash out the mouth and throat, clean out the nostrils, then give the oil.

The Apiary.

Uniting Colonies.

It seems to be inherent in the honey bee to be constantly employed, probably instinctively, in the several avocations that give employment to all the laborers in the hive. While there is honey to gather, in a pleasant, fine day for business, there will be few idlers, except the drones, found about the hive. A colony that is favorably located, and is healthy, will generally commence breeding so early in the season as to have a crowded hive by March, April, May or June, depending upon the latitude, farther north or south. In New-England, reckoning from the southern to the northern parts of the country embraced in those States, the time for the issue of the swarms, varies in their commencement from early in May at its southern parts, to some time in June at the northern parts.

Divide the colony, when the hive is filled with bees, into three equal parts, placing each part in a hive giving sufficient room for full stores for winter, for each of the three colonies, and very little surplus can be secured. Give in surplus boxes the same room that is embraced in the two additional hives, and let the colony unite in their energies, gathering in one hive, and we obtain a surplus amounting to from 75 to 200 pounds, or more, depending upon the field and the season. It is very easily apprehended that three-fold energies, put forth in one hive instead of three, give these favorable results in surplus. With such arrangements made that the force from two, or even three old colonies, may be concentrated into one colony, with surplus boxes equally convenient for storing 600 pounds of surplus in one hive, why may not that amount be taken from one hive, with the triple force of workers, just as readily as 200 pounds by one-third of the force?

To secure this result it is only necessary to unite colonies in one hive (which is suited to this object, with only room in the breeding apartment for wintering the common product of the queen in the fall season) preparatory to winter. The one or two aiding colonies would thus be reduced by the transfer to one main colony. Might not the plan work favorably? I have so much confidence in it that I think the plan worth a trial. If one colony gives 200 pounds, why may not two colonies with equal facilities give 400 pounds? or why may not three colonies, thus united, give 600 pounds? Each breeding department of each hive may go into winter quarters with its winter stores, or be fed, if there were any lack, and be ready with full force to enter upon its harvest the next season.—*Vermont Cor. Country Gentleman.*

SWARMING.—For some days before swarms issue, the bees may be seen clustering at the entrance of their hive—though we have seen some swarms that would come forth with but little or no indications of a swarm. When honey is abundant, and bees plenty, you may look for them to come forth at almost any time from the hours of ten to three in the afternoon, (first swarms) second and third from seven in the morning until four in the afternoon. Have your hives ready, and in a cool place. Be sure they are both clean and sweet. They will need no washing of herbs, or salt water, or whisky to induce them to stay. They need to be protected from the hot sun. Should the sun strike the hive, it is very apt to compel the bees to leave—they cannot stay where it is too warm to work their wax.

The Dairy.

The Best Depth of Milk for Cream.

Experiments made to ascertain the best depth for setting milk for cream, gave the following results: A lactometer of the usual width, 10½ inches high, gave 12 degrees of cream. A glass vessel 2½ inches wide with 3½ inches depth of milk gave 3½ degrees of cream. Another vessel of glass with 2 inches depth of milk, and 10½ inches wide, yielded not quite 2 degrees of cream. The milk was not a mixture, but all from the same cow, and stood 36 hours. This would warrant the opinion that cream is not cast up in greater quantity when not placed in very shallow vessels. The cream was carefully taken off the two latter vessels, and the skimmed milk put into a lactometer; that from the widest vessel gave two degrees of cream, and that from the second in width, about half a degree. A thermometer, placed near the vessels, ranged from a little above 47° to nearly 50° the whole time.

A Handy Cream-Gauge.

Mr. Douglas, of Vermont, suggests a plan for testing the quantity of cream to a given quantity of milk, which is at once simple and convenient. He takes one of the common pails or cans used in the deep setting or pool system, and has the tinman cut out a slot, inserting in its place a strip of glass. These pails or cans, it is, perhaps, needless to say, are twenty inches deep by eight inches in diameter. A strip of glass six or eight inches long, and two or three inches wide, will be sufficient. If grooves are made in the tin, and the glass inserted with white lead or some other cement, so as to be water-tight—leaving no places for the milk to accumulate, and so that it may be readily cleaned—the vessel is now ready for marking. The graduation should be marked on the tin, alongside of the strip of glass, so as to show the percentage of cream for a given quantity of milk. The milk being placed in the can up to a given mark, is then set aside in the pool, for the cream to rise. When all the cream is up that will rise, the division between it and the milk can be seen through the glass, and of course the percentage will be easily read off from the graduation marks on the tin along the side of the glass.

Salt for Dairy Cows.

Probably there are few things among the many unsettled problems of agricultural science, upon which so much diversity of opinion exists, as upon the subject of salting cattle. Long-continued experiments on the effects of feeding salt, the right quantity, the time and the manner to give it, are urgently needed. We look to our Ontario School of Agriculture, to establish something definite on this point when the institution is fairly under way. Meanwhile, we must be contented with the individual experience of farmers, on this as on other points. A correspondent of the *Western Rural*, who has been a dairyman from his youth up, furnishes his quota of information. Will some of our Canadian farmers supplement it? He wintered twenty cows one season without salt for about four months. They did well as to flesh, but a majority of the calves dropped that spring never got a full breath of air into their lungs, having an enlargement or swelling around the glottis, that prevented breathing. This experiment satisfied him that it was best to feed salt. It was the universal practice, continues the correspondent, when I was a boy, to salt cattle, occasionally dropping in handfuls about the field, letting each animal do the best she could toward getting her share. Observation led to a change in practice, and the other extreme followed. A tub or kettle was placed in the field or yard, and salt kept therein, the cattle having free access thereto, and this plan is still advocated and practised to a large extent. My experience and observations have convinced me that this is not the most profitable way. I have known cows, under the management of the most careful, to be entirely dried in their milk and sick for days by getting too much salt, probably by drinking brine from the salt tub. There are usually some cows in every dairy that will eat more than is good for their health, and these are kept continually under the influence of a cathartic which is destructive to the greatest flow of milk.

I took to measuring each cow her mess of salt, feeding in the barn. Some would eat it as greedily as meal and not be satisfied; others would lick a little and want no more, but the amount of milk sent to the factory the next day would be below the average. The second and third days would be above the average. This unsteadiness in the yield led me to try the plan which I have adopted and

now advocate; that of feeding in small quantities and often. I feed every third day, not more than a table-spoonful each, always in the barn, that each may have her share, and it never lessens the next flow of milk, but increases it, and satisfies the appetite also.

It is a little more labor to feed in this way than to put a half bushel in the tub every few days, but when the neighbors who meet you at the factory each morning begin to inquire, "How much behind am I to-day?" it shows that close attention to details will tell.

More about Cheese-Making on a Small Scale.

In last month's issue the *CANADA FARMER* gave directions for the making of cheese on a small scale. The subjoined, from the *Massachusetts Ploughman*, will supplement it excellently, being more in detail on several points upon which we touched but lightly:

It is important that rennet enough should be prepared at once for the whole season, in order to secure as great a uniformity in strength as possible. The object should be to produce a prompt, complete, and firm or compact coagulation of all the cheesy matter. To obtain a good quality of rennet that will effect this, the animal should be in perfect health, and the stomach should be emptied of its contents, salted and dried without any scraping or rinsing, and kept in a dry place for one year, when it is fit for use, but if it is allowed to accumulate dampness, it will lose its strength. In Cheshire, so celebrated for its superior cheese, the contents of the stomach are frequently salted by themselves, and after being a short time exposed to the air, are fit for use; while the well-known and highly esteemed Limburg cheese is mostly made with rennet prepared as in Ayrshire, the curd being left in the stomach, and both dried together. The general opinion is that rennet, as usually prepared, is not fit to use till nearly a year old.

Perhaps the plan of making a liquid rennet from new and fresh stomachs, and keeping it in bottles corked tight till wanted for use, would tend still further to secure this end.

The use of annatto to color the cheese artificially is somewhat common in this country, though probably not so much so as in many other countries. Annatto, or annotto, is made from the red pulp of the seeds of an evergreen tree of the same name, found in the West Indies and in Brazil, by bruising and obtaining a precipitate. A variety is made in Cayenne, which comes into the market in cakes of two or three pounds. It is bright yellow, rather soft to the touch, but of considerable solidity. The quantity used is rarely more than an ounce to one hundred pounds, and the effect is simply to give the high coloring so common to the Gloucester and Cheshire cheeses, and to many made in this country. This artificial coloring is continued from an idle prejudice, somewhat troublesome to the dairyman, expensive to the consumer, and adding nothing to the taste or flavor of the article. The annatto itself is so universally and so largely adulterated, often by poisonous substances, such as lead and mercury, that the practice of using it by the cheese maker, and of requiring the high coloring by the consumer, might well be discontinued. The common mode of application is to dissolve it in hot milk and add at the time of putting in the rennet. It may be put upon the outside in the manner of paint.

The cheese tub should be so graduated that it may be correctly known what quantity of milk is used. This is requisite, in order that the proper proportions, both of coloring matter and rennet, may be used. The temperature should be ascertained by the thermometer. Experience proves that when the dairy has been at seventy degrees, the best temperature at which to run the milk will be eighty-four degrees, but, as the temperature of the dairy at different times of the year will be found to vary above or below seventy degrees, the temperature of the milk must be proportionally regulated by the simple addition of cold water, to lower it; but to increase the temperature, heat the milk in the usual manner, although it is absolutely necessary to avoid heating it beyond one hundred and twenty degrees.

After having brought the milk to the required temperature, and added the coloring, for every quarter hundred-weight of cheese mix one point of new sour whey with the requisite proportion of rennet; and, having arrived at the formation of a good curd, which will be the invariable result of a strict adherence to the foregoing rules, let it be carefully cut up with three-bladed knives, as fine as possible; then dip off half the whey, and heat a portion of it to the temperature of ninety-five degrees, and return it to the whey and curds, then, after stirring it for five minutes, allow the curd to sink, and as quickly as possible dip off the whey. Having done this, press the curd by placing on it a board weighted with from three to five fifty-pound weights, which will gradually and effectually press the remainder of the whey out.

To CURE SELF MILKERS.—A correspondent of the *Indiana Farmer* relates the cure of a self-milker by smearing the teat with a compound composed of grafting wax (softened by the addition of a little lard) and cayenne pepper. The teats, of course, have to be cleaned before milking, but in a couple of weeks he found the habit so effectually broken as to render further applications unnecessary.

Profits from Dairying.

For the benefit of farmers in neighborhoods where it is proposed to establish cheese factories for next season, it may be well to give some general statements as to what may be expected. Annual receipts of from \$50 to \$100 per cow are reported, and truthfully, by some dairymen, but such returns as this are not to be expected by farmers generally, especially at the first. The following is probably a fair average, for average cows, on common or poor grass, and with only ordinary care during winter. The cheese factory should be kept in operation at least six months, say from May 1, to Oct. 31,—or say 180 days. During this time the cow should give 3,000 pounds of milk, making 300 pounds of cheese. For this milk the farmer will receive from \$27 to \$30. During three months more the cow will give say 1,000 pounds of milk—making from thirty to thirty-five pounds of butter—worth from \$6 to \$10.

Much better than this is done by many; but the receipts of many fall considerably below these figures.—*Western Farmer*.

THE MANUFACTURE of butter and cheese in 1840 was represented by 202,410,410 pounds, in 1870 by 677,018,095 pounds.

A CORRESPONDENT of the *Country Gentleman* states that thirty cows yielded 94,525 quarts of milk in a year—3,150 quarts per cow—60 quarts per week for each cow—or 8.57 quarts per day. The greatest monthly yield was in May—9,946 quarts from the thirty.

TO AVOID GREASY BUTTER.—L. B. Arnold says:—"Churn with pressure instead of friction.—The dash churn brings butter by pressure, and makes better butter than most other kinds of churns for that reason. Butter should also be worked by pressure instead of friction. The ladle or worker should not be drawn across the butter, but pressed down upon it."

AVERAGE FEED OF COWS.—At a meeting of milk producers in Massachusetts some time since, a Mr. Wetherell stated that cows upon an average need forty-five pounds of hay per day or its equivalent whilst giving milk. That large cows produce more milk for the amount of feed given than small ones. That scrub cows will give annually 1,400 quarts of milk, whilst the Holstein and some other breeds will produce 4,000. All cows should be kept clean, as well as their surroundings. In producing winter milk, cows without grain will do nothing.

COAL OIL LAMPS INJURIOUS TO MILK.—One of our dairymen, whose butter has a high reputation in this market, informs us there had lately been some complaint about it, the cause of which he for a time was unable to discover, but finally traced it to the fumes of a coal oil lamp used in lighting the milk room. It shows (if such a word is proper), the extreme sensitiveness of milk to the least impurity in the atmosphere, and its rapid power of absorption. The difficulty was entirely removed by putting in a tin ventilating tube, leading from the top of the chimney to the outside of the roof. The butter was not afterward complained of.—*Practical Farmer*.

WHITE SPECKS IN BUTTER.—L. B. Arnold says that white specks occur from several causes. The first cause he notes is the result of coagulation of the milk remaining in the cream by a minute germ. Any cause that ripens milk rapidly will produce the germ. When the germ grows, a little white speck is formed. Then a little gas is generated and the process continues throughout the mass. If the milk is feverish, this process is apt to proceed rapidly, and the specks will gather on the top. Other specks come from dried cream. Other are produced by the action of light. He had tried two measures of the same milk, and had one sleeky and the other not. One pan stood in the light, and this developed the speck. The other stood in the shade, and had no specks. Scalding (heating to 130 degrees, he defined to be "scalding") the milk will kill the germs and consequently prevent specks. A milk room should be just light enough so that one can read a newspaper, after being in the room ten or fifteen minutes.

EFFECT OF OIL-MEAL UPON BUTTER.—To a correspondent who enquired if linseed meal fed to cows will have any effect on the butter, the *Lige Stock Journal* replies that it will, but the effect will be beneficial, generally, when fed in winter. The flavor of all butter is derived from the food. When the cow has a variety of grasses, such as white and red clover, and the sweet-scented varieties of old pastures, the butter has, when well made, a fine aromatic flavor. If you feed upon one kind of hay in winter, your butter will not have so fine a flavor as when fed upon a greater variety. Add oil-meal, and the flavor will be improved; add to these carrots and corn-meal, and a still finer flavor will result. There is nothing about oil-meal to injure the keeping qualities of butter; unless fed in too large quantity, when it would affect the health of the cow, being too laxative to be used as a principal food. Not more than 2 to 4 pounds should be fed to a cow per day, and that is better given with coarse fodder. Oil-meal, given in small quantity, say one quart per day, will have an excellent effect upon the health of the cow, quality and quantity of butter.

The Canada Farmer

TORONTO, CANADA, APRIL 15, 1875.

Work for April-May.

"These are the times which try men's" backs. The hurry and hard work of the Canadian farm are fairly upon us. Those farmers who have read and profited by our advice to have all things ready and in order, will sail into their work this month in fine style, keeping fairly ahead, and not giving their work a chance to crowd them. On the contrary, Mr. Never-Ready finds at the last minute that his ploughs are rusty or broken, his harrows minus their teeth, his horses sickly and weak, and his work crowding him on every hand. He makes frantic efforts to get even, and vows that next spring shall find every peg in its place; but it will not be so, for it is not in him to do it. He belongs to the class which does not read. He hates to have his memory jogged by pestilent "book-farmers," about the thousand and one things which he ought to have done but has left undone. So he will run through the inevitable gamut of debt, mortgage, foreclosure, and beginning life again.

As we write in this second week of April, a long spell of genial weather has done wonders in dispelling forebodings of a late spring. Not, considering the almost unprecedented amount of snow, can there be said to have occurred the amount of damage from freshets that we anticipated last month. The losses from this source have been greater than usual, but still not so much so as might reasonably have been dreaded. However, we must not flatter ourselves that we have done with frost and snow for good. Before this reaches our readers, we may be growling again about the lateness of spring.

No matter how well-prepared the farmer is, there will be plenty to do on wet days, and days when it is too wet underfoot to allow the teams to be on the land. Harness can be gone over and oiled, implements cleaned and oiled with petroleum, both the wood and iron parts, axes, hoes, and spades can be ground; surface water let off by cutting ditches; fences and gates repaired; seed potatoes sorted; underdraining can be done, and many other things which will suggest themselves to the farmer who is anxious to get ahead of his work.

European reports seem to indicate that the wheat has wintered well, and, so far, American reports have a favorable tenor. This means, unless war or an unfavorable season should occur, low prices for wheat. We again direct our readers' attention to the growing of barley, which, with the rapidly increasing demand for the best qualities in the United States, can scarcely be overproduced here. The best grades will always be in request, and our farmers can grow the best on the continent.

The necessity for using good seed, and taking pains to cleanse it from impurity, is now recognized. While the soil is too wet to be worked is a good opportunity for a final touching up of the seed. Do not go on the land before it is fit to be worked. By ploughing it in too wet a state, damage may be done, the effects of which will be felt for years. Those who fall-ploughed their land intended for spring crops, will now find the benefit of it. Their land after its exposure to the frosts of winter will be in a workable condition much sooner than that which was not fall-ploughed.

Before sowing, seed wheat should be steeped for several hours in a strong pickle made by dissolving a peck of strong coarse salt in 20 gallons of water, and adding thereto one pound of sulphate of copper (blue vitriol). This destroys the spores of smut which may exist on the seed. Seeds which float on the surface of the pickle should be destroyed.

In seeding clover, experience has shown that sowing on the last of the snow is a successful way. The seed finds its way to the ground and the light frosts of early spring work it in. As soon as the ground is settled, an application of about 150 pounds of gypsum to the acre, will promote a rapid growth and protect it from early drouth. Clover does better with barley than with oats, as the latter is apt to lodge and smother the young plants. Ten to fif-

teen pounds per acre, the latter preferably, is the usual amount sown.

For barley, the land can not be made too fine. The crop should be got in as early as possible, but it will be better to wait till the land is in first-class condition, rather than to hustle it in hurriedly. Roll when it is about two inches high.

Oats can be sown on a wetter soil than barley, and will succeed better, and so do peas, than that gram on newly-turned sod.

Potatoes require large quantities of fine, well-rotted manure, well mixed with the soil. Harrow as soon as weeds appear. Look sharply after the Colorado beetle, and hand-pick them before they can multiply themselves. Paris green, mixed with water, is effectual against these pests, but we are not prepared to recommend its use, except where great care is used.

Give old pastures a top-dressing of good farm-yard manure, or a liberal dressing of bone-dust. Scatter seeds over the thin places, and harrow over the whole surface.

Do not turn out stock to pasture too early. By doing so, both stock and pasture may be damaged seriously. It will be better to wait till there is a good bite and the soil has become firm.

The horses and working oxen, whose time of tribulation has come, should now be fed in proportion to the work expected from them. If any mistakes are made in feeding them, let them be on the side of liberality rather than economy. Above all feed them regularly, and then the animals themselves will let you know when your help has neglected to supply them with their usual allowance. See that the harness fits the horses and is soft and pliable, so that their flesh will not be galled, and they crippled for the season.

In-coming cows should be separated from the rest of the herd and well treated. Their food should be liberal and of a sloppy nature. Treat the calves kindly. Give them a warm house and plenty of milk. The same will apply to sheep and lambs, and to farrowing sows. If lice are found to trouble stock, apply some of the remedies mentioned in last month's issue. The high price of pork will cause more farmers to direct their attention to swine-breeding. Let them choose well-bred swine, and not mind paying a good price for a pair of Berkshires, Chester-whites or whatever breed their fancy may choose.

In the orchard there will be grafting to be done. The scions must be cut before the buds begin to swell, and packed away in sand till wanted, as directed last month. When the buds are swelling is the right time to graft. The stone fruits will be ready first. In planting trees, make the hole large enough so that the roots will not be cramped, and do not set them deeper than they were in the nursery row. Wash the trunks of the orchard trees with soft soapsuds or lye, to destroy insects' eggs.

The vegetable garden will call for steady work. Nearly all the garden stuff should be sown this month. Beets, peas, onions, and parsnips will stand considerable frost and may be sown as soon as the ground is in condition.

Currant cuttings may be planted in rows two feet apart and six inches in the row. Raspberries and blackberries should also be set out as soon as the ground is dry. Grape cuttings should be planted in rows, eighteen inches apart, and four inches in the row. Strawberries want setting out as soon as the soil is fit. Newly-planted beds should not be allowed to bear first year. Get ready plenty of mulch for use before dry weather comes.

If you have several hired hands, do not attempt to do too much work yourself. It is obvious that, unless the farmer be an extraordinarily vigorous man, he cannot do as much manual labor as his help, and, in addition, superintend and plan his work. A judicious man will see where his presence and example will infuse life into the exertions of his help. He will reserve himself for an emergency, and, meanwhile, can employ his own time more profitably than in the heavier labors of the farm.

Breeding Horses for England.

The recent decree of the German Government prohibiting the exportation of horses from the Empire, though supposed to be directed against France, in reality will operate more strongly against England. The latter country for many years has imported large numbers of carriage,

draught, and cavalry horses from Germany. One of the sporting papers states that three-fourths of the horses in London have been imported from Germany. The English papers are beginning to enquire what they shall do about it, as not only does England want horses, but France is trying to get 10,000, and Spain 5,000.

In the year 1873, 17,822 horses were imported into England, of the value of £585,868. This would make the average value of each animal to be \$165. At this price, horses cannot be bred profitably in England, except in sections where the land is very cheap, and unfit for other purposes.

We do not see why Dominion farmers should not direct their attention to raising horses for the English market. The difficulties of transit now-a-days are light and decreasing. The shutting-off of the principal source of supply will raise the price indefinitely. At \$165, the present average price, good serviceable carriage and draught horses could be bred here and transported to England, leaving a handsome margin of profit. We commend the subject to the attention of our farmers.

A Bermudian on Canadian Farming.

Any one who wants to buy a farm in the Bermudas can get one cheap by addressing one William Carr there. At least that is the impression we get from a column and a half of abuse of Canadian farming in the *Mark Lane Express*, over that signature.

The writer states that he was asked whether he would advise a young Englishman with two or three thousand pounds to come out to Canada to farm. As an answer, he cites two or three instances of unsuccessful farming in Quebec, and a case of a once "fast captain" who came to New Brunswick with £7,000, and is peddling note paper and lollipops for a living. These cases, he argues, prove that Canada is the worst place on earth, except to lose money in.

He winds up by saying that he spent the closing months of last year in Nova Scotia, and that "no greater contrast can be imagined than between Nova Scotia and these beautiful Bermudian Islands, where frost and snow is never seen by any native who is untravelled; and where bananas, orange trees, palms, and India-rubber trees takes the place of the pine and the birch." And he might have added "where yellow fever and miasmatic diseases of all kinds are constant guests; and where pestilences are so rife that the British garrison has had to be removed more than once to save it from annihilation, to that very Nova Scotia which suits him so badly."

It is true enough that some young Englishmen come out here and fail to succeed. It is also true that many young Englishmen come here and do succeed. Those who fail, generally do so because they persist in locking up all their available capital in improvements which will not pay their cost in a generation.

Canada is not the only place where some young Englishmen fail to succeed. There is not a section of the globe where there are not young Englishmen who have failed to succeed - and nowhere are they so plentiful as in England itself.

"Fast captains" are the last persons to succeed as colonists; and had our New Brunswick lollipop-peddling "Fast Captain" cast his lot in that Tophet in mid-Atlantic, which the *Express* correspondent cracks up so highly, he would assuredly have lost his life as well as his £7,000.

PLEURO-PNEUMONIA was unknown among Australian cattle until 1858. A Mr. Boodle then arrived in Victoria with a cow which he had brought out from England. Soon after her arrival she was found to be suffering from pleuro-pneumonia. Vigorous efforts were made to stamp out the disease. A subscription was raised, large enough to pay for all Boodle's cattle, which were destroyed. The greed of a neighbor, however, rendered all the precautions nugatory. He put some of his cattle in the infected paddocks, and the disease was spread throughout the colonies. Few persons arrive at the dignity of having cost so much money as this to us nameless Antipodean. He is probably the most expensive of all the tough subjects who have gone, or have been taken to Australia. It is estimated that, since 1858, 1,750,000 head of cattle, forty per cent of the whole number, valued at eight millions sterling, have died of the disease.

Managing Men.

To manage men properly requires a thorough knowledge of human nature. There are many men who imagine that a great deal of bluster and profanity is necessary to secure the greatest amount of labor. This is a grievous error.

If any one will notice a gang of men whose foreman is sour, cross and surly, and whose mouth is always full of oaths, it will be seen that the men care little for what they are doing. They always keep at least one eye on the "boss," and as soon as his "back is turned" they commence to "soldier" at once. If he leaves them, they are not anxious to make a good showing on his return, for they are sure of abuse, however faithful they may have been in his absence. There is nothing to encourage them, and all they care about is to get along as easily as possible until pay-day.

Good workmen will not stay with such a man, and such foremen can seldom keep other than a gang of reckless, third-rate workmen together. Usually this kind of men manage their work without any system or regularity. The men get in each other's way; they get each other's tools; they take hold of things at the wrong end; everything is hurry and confusion.

If a foreman is of a kind disposition, possessed of a cool head and good judgment, with a friendly feeling existing between himself and the men under his charge, they need no urging in cases of emergency. A cool-headed man is usually possessed of good judgment, and knows how to place men so that they can work to good advantage. Every move counts, and work is rapidly performed without any seeming hurry, whereas the snarly, quick-tempered man will worry and fret both himself and every one around him and accomplish but little. Good nature is indispensable to the successful management of workmen, but it should be accompanied with sufficient firmness and decision to prevent any undue liberties on the part of the workmen.

Paris Green.

Last month we touched upon the danger of using Paris Green to destroy insect life on vegetables. We showed that, though there is no evidence that the tubers of potatoes can take up this poison unassimilated, there is abundant proof that other plants can and do take it up; and as, when once applied to the soil, it would remain there until taken up by plants, the danger of successive annual applications, even in small quantities, becomes apparent. A letter from R. U. Piper, a Chicago chemist, contains evidence bearing out these assertions. It appears that Prof. Tuson, of King's College, London, has made elaborate experiments on the effect of arsenic on vegetation. He says that arsenic has been employed as a steep for seed wheat, to prevent smut, and that M. Audouard states that he has detected traces of arsenic in the crops raised from seed wheat thus treated. It is so small an amount of the poison can so affect the soil as to be taken up by the wheat crop, what must be the result where it is used in many hundred times the proportion, as where it is scattered over fields of potatoes, and for successive years even. We shall do well to remember that arsenic remains arsenic forever, and suffers no change or loss of its poisonous properties during the lapse of years, or in whatever combinations it may enter. Both Dr. Edmund Davy and Prof. Tuson join in warning the public against the poisonous effects of arsenic, in so small a quantity as is found in "crude superphosphate of lime" used as a manure.

Davy positively states that arsenic, as it exists in artificial manures, is taken up by growing plants. He found cabbages and turnips giving unmistakable evidence of being arseniated.

"These facts," says Tuson, "have important bearings, for though the quantity of arsenic which occurs in such manures is not large, when compared with their other ingredients, and the proportion of that poison added to the soil must be very small, still plants during their growth, as in the case of the alkaline and earthy salts, take up a considerable quantity of this substance."

Further, as arsenic is well known to accumulate in soils, the effects after a time will probably be that vegetables thus manured will ultimately be found to contain arsenic, and will endanger the lives of men and animals."

"Our experiments," he concludes, "very carefully performed, confirm the assertions of Audouard and Davy."

Commenting upon the experiments of Dr. Tuson, Mr. Piper says.—"If the small amount of arsenic that can be introduced into the soil in the manner noticed above is considered so dangerous by these eminent observers, what must be the gravity of the case, as we have before said, where it is sowed broadcast over the field?"

"The mere dust of Paris green falling from the walls of papered rooms will destroy health and life; how much will it contribute to the health of the farmer and his family, and to their domestic animals, to live and work in an atmosphere filled with this dust, as it must often be when it is set in motion by the wind?"

"If animals are not directly killed by it, as is the case in some varieties, may not their flesh, as that of domestic fowls, be rendered poisonous as an article of human food? Individuals within our own knowledge have been poisoned by eating the flesh of the New England partridge, which was due to the bird having fed upon some poisonous berries. Similar cases, the cause of which has never been suspected, may have come from the source indicated above.

"We have now for microscopic examination a portion of human flesh, taken from the body of one member of a family, the whole of which perished from eating poisoned meat. This specimen was received through the politeness of Dr. Murray, of the town of Flint, Michigan. A case of arsenic poisoning, involving some of the principles described above, was brought to our notice lately. These cases are almost every day occurring, and it would seem as if it had become the duty of every one who has any knowledge upon the subject, to give it to the public."

In an AUSTRALIAN paper, one of their numerous "Sparrow Clubs" reports the recent award of premiums for "455 heads and 3,611 eggs," and another posted circulars through the district in which it operates, offering \$25 to the person who would destroy "the largest number over 500" before the end of February. A part of the indictment against these birds is that they "strip the ears of wheat several yards in width around the edges of the field," and leave "nothing but stones on the cherry-stems." It is added that, "although the sparrows can be kept somewhat within control, the cost seems likely to prove a burden on a class which can ill afford it." It is probable that it is the indigenous "Red-billed sparrow" against which the operations of the clubs are directed. This bird exists in vast flocks and is very destructive. It is scarcely possible that the European sparrow can have multiplied so prodigiously, during the short time which has elapsed since its introduction into Australia, as to necessitate such vigorous measures of warfare. But Australians have been disastrously successful in other acclimation experiments. Some genius went to great expense, a few years ago, in introducing rabbits. The climate suited that furred quadruped so well that he threatens to annex the entire continent. On some estates, it costs thousands of dollars annually to keep their numbers down. Weasels and stoats have had to be imported to assist in thinning them out.

In THESE DAYS, says Dr. Cross in the *New York Tribune*,—and we commend what he says to Canadian farmers—several farmers have adopted a new idea, that is of having their girls to keep the accounts of the farm. First, they are taught to write a fair hand, then to have a knowledge of single entry bookkeeping, when a proper set of books is obtained and they go to work. A map is made of the farm, having the fields numbered, and then whatever work is done on a field, or whatever capital invested, the girl is to find out and set down, and the result is that she soon takes a practical interest in affairs, which interest increases as the seasons pass and the crops are gathered, of all which she takes account, both of quantity and quality. The next step with her will be to become possessed of a realizing sense of what farm products cost, and when she sees upon the striking of balances, after a year is gone, or perhaps two years, how little is the net profit, she sees that a dollar is worth much more than she had suspected. So she will begin to reflect whether the work was done well or ill, and to consider upon better methods, and in any event she will learn that economy is an indispensable quality in whatever engages human attention.

Laying on Water from a Distance.

EDITOR CANADA FARMER:—I wish to bring a supply of water, for house and barn use, a distance of 600 feet, with an ascent of about eighty feet, and am in doubt whether to use a ram or force pump, the power for which could be readily supplied from machinery in saw mill. Will you kindly give me your opinion as to cheapness, efficiency and durability of the two methods.

I have also a well, on a level, about seventy feet above the house and 600 feet distant, from which a supply could be had, and it has occurred to me that, in order to save digging a deep trench, the well being about fifteen feet deep, the pipe could be constructed upon the principle of a siphon. Would this be practicable? If gas piping be suitable for the purpose, what size would answer for the different methods named.

O. C. H.

Hayward's Falls, Ont.

As you have the power ready to hand, (water power, we presume, costing nothing), the force pump would be preferable in cheapness, efficiency and durability.

It is possible, of course, to apply the siphon principle to any place where the exit of the water from the tube would be lower than its point of entrance into the tube. But we doubt its practicability in your case. The difficulty would be to exhaust the air from the pipe after it was laid. Of course this would have to be done before the water would flow. It might be done by closing the pipe at a level below the surface level of the well, and then filling it by means of a pump at the highest point of the pipe.

Gas pipe would do where only square corners are wanted. An inch pipe would certainly be large enough; probably a three-quarter or even smaller would do. We are not aware if gas pipes are made with any thing but square angles.

"WARTS ON A COW'S TEATS," says the CANADA FARMER.—Really, we can't tell you, unless it is the milk-maid's fingers.—*Cincinnati Times*. Wait till the scissorners take this in, when you'll see the calves at 'em.—*St. Louis Republican*. Has any udder cheap punster a suggestion to make? This is a game of teat for tat. *Chicago Times*. What unfilial wretches must these American sucklings be to make puns on their mamma!

PROF. DE BARY has been selected by the Royal Agricultural Society of England to investigate the potato disease. This gentleman is already known to science for his researches into the disease. He lately discovered that the disease is not propagated by defective tubers, and that, although the mycelium was distinctly apparent in the stalks of plants raised directly from diseased tubers, yet that neither gonidia nor germs were evolved. He also expresses the hope that he has at last discovered the resting-places of the oospores, or the active primary germs of the fungus.

MR. MECHI WRITES to the *London Farmer* in praise of iron hurdles on wheels for sheep tending. Although expensive at first, they are so durable, he says, as to repay for the original outlay. The hurdles he bought thirty years ago are little the worse for wear at the present time. He had foresight enough to value iron hurdles when iron was cheap. That which cost him £50 nearly a generation ago, if sold by public auction would, no doubt, he says now bring all the money back again. The great ease with which hurdles on wheels can be shifted about is greatly in their favor, and they are easily adapted for many purposes, such as with Mr. Mechi, in sometimes "dividing a pasture where cows are fed." Mr. Mechi once more condemns the wasteful amount of land under fences in some districts.

WE ACKNOWLEDGE THE RECEIPT from a Vermont man, of a sample of "Hullless Oats," which, he claims, is a novelty. If a variety can be called a novelty, which was known and described in England nearly 300 years ago, and which was tried on this continent and found to be of no value, forty years ago, then the Vermonter has got a novelty. When the Duke of Wellington was shown a newly-invented steam-gun, designed to supersede the use of gunpowder, he examined it carefully, and gave his verdict thus drily:—"If the steam-gun had been invented first, what a wonderful advance we should have made when we had invented gunpowder!" So, if the skinless oats had been invented first, we would have made a great improvement when oats with hulls had been originated.

Some Requisites for Successful Farming.

Dr. G. H. Cook made some sensible remarks about things which are necessary to success in farming, at a meeting of the Middlesex, N. J., Farmers' Club. We reproduce them in part:

Good land is the first essential. The man who holds poor land, or undrained wet land, and does nothing with it, is losing money on it all the time.

The next thing is to get and use all the animal manures he can, by keeping all the stock he can, and by buying it, when circumstances are favorable. The next most important is the roots of clover and grasses. A good sod will give a good crop which would need twenty or thirty tons of manure, if grown on bare ground. There is no way of manuring so cheap as turning under a sod.

Lime and plaster, although somewhat neglected of late years, are of great importance. There are lands in New-Jersey which have grown a crop of wheat every third or fourth year for a hundred years, with no other manure than clover and lime. Often the good results obtained from superphosphate are mainly due to the plaster contained therein. Study and experience have made it plain that ammonia, potash, and phosphoric acid have each their separate uses and cannot be substituted for each other. It is idle to apply an ammoniacal manure, such as guano, to clover.

The farmer should know to what crops these different ingredients of manures can be profitably applied, to be able to use them most economically. Ammonia used freely has given the best crops of corn. There is still considerable uncertainty upon the point of the proper application of manures to different crops, which can only be solved by the experience and observation of farmers.

Now, as in the olden times, no man can succeed in this pursuit without industry, economy and skill. Every one knows that farming is hard work, but the industry spoken of must consist of regular and continuous work; not hard work at one season and idleness at another, but steady, persevering work all through the year. Such labor has not only a surprising influence upon the success of the farmer, but even upon his character. Work must be begun in good season, and continue energetically all day. It will not do to work in a dull and listless way and cut short the day at both ends, or the profits will be likely to be lost altogether.

Economy is another very important essential. Economy not only in spending, but in saving; in the management and application of labor, so that all the work done may be done to advantage. The farmer must have a variety of crops and work, so that all his labor may be advantageously employed all the year. In this way prosperity will not depend altogether upon one or two crops, but, having a variety, the farmer will be more certain of being able to make a living and pay his necessary expenses.

Another requisite is skill. No farmer can succeed without at least a moderate degree of skill in handling tools and managing crops. A knowledge of the proper times and ways of planting is very important. With many crops a failure to plant at the right time, and in the right way, will ensure a partial, perhaps total, failure of the crop. In reference to stock, skill is absolutely essential. Such skill as the farmer needs, must be acquired by practice and experience, and without it he need not expect to succeed.

The Ideal Agricultural College.

In last month's CANADA FARMER, we treated at length of the subject of Agricultural Education and the means to secure it. We gave an outline sketch of the manner in which the School of Agriculture or Agricultural College should be conducted. The President of the Kansas Agricultural College, Rev. J. Anderson, gives his idea of the future Agricultural College in the "Handbook" of the College. We do not see how it is that, with a President holding such clear ideas of the way to make farmers, the Kansas College should be one of those noted for the fewness in number of its students who take to agricultural pursuits after going through its course. President Anderson sees "in his mind's eye," somewhere or other, "an Agricultural College looking so much like the grounds and buildings of a prosperous farmer who did his own repairing and manufacturing, that we of the present, happening by, would mistake it for a little hamlet of thriving artisans, built in the

heart of rich and well tilled fields. Nothing in its appearance would suggest our notion of the typical college. Its barns, sheds, yards and arrangement would embody the idea of the greatest utility at the least cost. Its implements, stock and fields would show them to be used for real profit. Its orchards and gardens would not only reveal the success of the owner, but, also, his full determination to enjoy the fruit with the labor.

"We would be quite certain that it was only such a farm—the best specimen of the highest type—were it not for the presence of cheap, stone buildings, one or two stories, scattered among the trees; all of them more resembling mechanics' shops than anything else; some exactly; others not exactly; and yet no two alike. One would be used for teaching practical agriculture, but would as little prompt our idea to a recitation room, as the whole cluster would that of an imposing college edifice. While there would be seats for hearers and a place for a speaker, yet the latter would most suggest a circus ring for the exhibition of horses, pigs or sheep; of surgical operations; Short-horns, when Short-horns were discussed; of plows, harrows or reapers. The walls would be lined with photographs of famous herds, working models of farm machinery, the grain and stalk of cereals. Part of its surrounding ground would be belted with every variety of growing grasses; and another would be for the draft-test of implements, or the trials of student skill. In fact, it would so look, and so be, like an actual workshop of real farming as not, even in the remotest way, to squint toward the article generally y'clept 'scientific agriculture.'

"The interior of another shop, a few rods distant, and equally inexpensive, with its grafting tables, posting benches, packing room, working greenhouse, and outside hot-beds, and thrifty nursery grounds, would look so much like 'gardening for profit' as to throw us completely off the trail of botany as a pure science. Another would be a force shop, where light, heat, water, sound and electricity were made to reveal their laws, habits and effects, and to do their industrial work.

"There would be a mathematical shop, so much like a counting and drawing room, that, when it led into an inventor's and pattern maker's room, no one could be surprised at its winding up in a machine shop. There would be an English shop, remarkably like a printing office; and the 'Printer's Hand Book' of that day might strike us as an admirable drill in the art of using the English language, as well as in that of sticking type—almost as good as a grammar! There would be a woman's workshop, where the pale Hortense, at heart a good deal more sensible, earnest and womanly than society suppose, would strive for the bloom and 'faculty' of Mary. The blessed Mrs. Grundy would be dead! And there would be mason's, carpenter's and smith's shops.

"Not a shop of them all would cost \$5,000, and some, not the half of it; because they would be shops, warm light, cheerful, but workshops—not requiring costly foundations and tall, heavy walls, not finished as are parlors, not wasting space in broad corridors. And they would not have been fore-ordained by men of a previous generation, who, to save the lives of the best of them, could not possibly have foretold just what buildings such a college would need. As in the progress of its growth, a want had been felt, its shop was supplied; and each generation had footed its own bills.

"No! it would not look like our great colleges; but very remarkably like a nest of real educational workshops, where flesh and blood students acquired marketable skill for industrial labor. In it, drill in the art would have greater prominence than the stringing of facts on the threads of a system; and the requirements of art would serve as a skimmer to lift the cream of science as needed. Knowledge would be shoved paying end first, and not, everlastingly, philosophic end first. For the world would have gotten back to the history of its own experience, when art was the Columbus discovering science.

"In it, educational common sense would have supplanted uncommon educational nonsense. And leaving it, the newly fledged graduate, as does the newly fledged 'jour.', would at once earn a living. Such an Agricultural College would be in keeping with its object, with the requirements and genius of labor, with itself! And, too, it would be in keeping with a rich, broad State, carpeted by emerald grasses, belted by golden grain, clumped with orchards,

moving with herds, clustered with villages, threaded by railways, flecked with countless smoke-offerings from the altars of industry to the God of labor.

"Some day; somewhere; somehow!"

HARES AND RABBITS, it is now found, will carry the foot and mouth disease, and thus render futile the attempts made for the last ten years in England to stamp out that disease. This will add to the strength of the cause of the tenant-farmers against their lords and masters.

AN ENGLISH LAW-COURT recently rendered a decision which is important to farmers. It was decided, when A's mare and B's horse were in different fields, and separated from each other by a wire fence, through which B's horse kicked and damaged A's mare, that this was a trespass by B's horse, and that B was liable in damages for injury done.

THE *Kölnische Zeitung* reports that besides Phylloxera and the Colorado Beetle, a third noxious insect has gone over to Europe from America; it is the so-called Blood Louse, which causes much damage to apple trees. As a practical remedy against this unwelcome guest, the *Garden* recommends the painting of the young tree with naphtha and lime-water.

A STRONG EFFORT is being made to revive interest in the Chinese Yam as a substitute for the potato. They have many virtues; such as growing in poor soil, taking care of themselves and requiring little labor; but they have one immense drawback—and that is, a habit of penetrating the earth to a distance of two or three feet. Fancy coming home hungry and having to go down that depth for your supper. We opine that the Chinese Yam will not entirely supplant the potato in our time.

THE *American Farmer* gives a discouraging account of the condition of affairs at the Maryland Agricultural College, one of the oldest institutions of its kind in the United States. It says the College has a mere handful of pupils, is in debt, and dissensions prevail in the faculty, as well as in the board of governors. The fact is that these institutions have a natural tendency to kid-glovely. Nothing but the most jealous supervision by the public can prevent their degenerating into the humdrum routine of the models they aim to ape—the Old World universities.

"THE PROGRESSIVE FARMERS" is the sensible name which an association of Illinois farmers have adopted. The object in associating is to improve agriculture by the giving of premiums for the best stock and crops, and to advance the interests of farmers generally. A *Prairie Farmer* correspondent, in whose neighborhood the association is strong, says that the result of offering these premiums has been remarkable. A neighborhood always loose in its manner of farming, at a single stride has stepped at least ten years forward; and that neighborhood, with an average season, will produce 50 per cent. more wheat than ever before, and it will be of a better quality.

THE MICHIGAN AGRICULTURAL COLLEGE seems to be an exception to the general run of Agricultural Colleges in the United States. Those institutions apparently aim to take rank in proportion to the number of agricultural students whom they have diverted from following farming as a profession. The Michigan College seems to have a higher ambition and to be successful in turning out not only farmers, but persons competent to teach farming. Former students at this College now hold good positions in other Agricultural Colleges, on which, doubtless, by-and-by, they will succeed in grafting the principles which have made their *alma mater* the most efficient of its type. In the Agricultural literary world, the *Western Rural* has, on two occasions, recruited the ranks of its numerous editorial corps from the graduates of this College. President Abbott, in a recent address, stated that no less than 42 per cent of the College graduates are engaged in farming or gardening pursuits. No other Agricultural College in the United States can approach the showing made by the Michigan College. We trust time will not prove us to be too sanguine, if we express our opinion that the day will come when an Agricultural College that can not turn out half of its graduates as farmers, will rank about as high in estimation as the average Agricultural College now stands.

Agricultural Intelligence.

New Methods of Slaughtering Cattle.

Many methods have been proposed, from time to time, to alleviate the suffering which the cattle given to us for our food must undergo while the vital spark is being released. The London Society for the Prevention of Cruelty to Animals has been making experiments in this direction, from the London Farmer's account of which we condense the following:—The various methods tried were Bruneau's, Baxter's, Sergeant's, Wackett's, and the "present London method," which is, of course, the pole-axe. The one in use by Mr. Cross (the butcher at whose establishment the trial took place) is a well-balanced, handy implement, wielded like a hammer, having a long peg or punch which penetrates the skull at one blow. The punch is very sharp at the edge, and hollowed out for an inch or less in a conical form, and is smaller at the point than at the base. Thus, whilst from the shallow concavity the skin and skull of the ox either drop out or are easily removed by the finger, the tapering point admits of the pole-axe being almost instantaneously withdrawn from the penetrated frontal bone of the animal.

All the other methods enumerated are variations of the same principle of piercing the brain. That of Bruneau, in use in the Paris abattoirs, is a mask of leather, having an iron ring in the centre, into which a loose peg or punch, with a flattened head like a nail, is inserted. The mask is attached to the face of the animal by straps buckled behind the horns and around the poll. A blow with a heavy mallet drives the punch inward, and death follows. In Baxter's method, the mask does not require strapping, as it is fixed on by springs on either side, just as spectacles are, and the punch is fixed, having a strong spiral spring intended to withdraw it after it has been driven home. Sergeant's implement is simply a modification of the pole-axe, having, with other objections, the disadvantage of being top-heavy. There only remains to describe the Wackett process, in which two implements are used, one being a hammer-like implement, containing a punch to be held in one hand, at rest on the forehead of the animal, and the other a wooden mallet by which the blow is administered. The punch is worked by a spring, as in Baxter's, to enable it to free itself from the skull.

Our cotemporary is not particularly struck with either of the systems. It says:—It cannot be affirmed that any of the above methods can be practised with greater facility than is now daily accomplished in our best slaughterhouses by the common pole-axe. In fact, the means of killing are to all intents and purposes the same—piercing the skull and brain. All that is attempted to be done by either method is only to perfect the same process of destroying—to secure precision and certainty of aim for the fatal blow. The masks conduce to certainty of aim from the blindfolding of the animal, as well as from the breadth of the mallet, and the large circumference of the punch-top to be struck. The objection is that much time is lost in fixing them. Wackett's method is open to the objection that both instruments are intended to be wielded by the same person. The handles are too short to be used by a single individual with vicious brutes. With a longer reach, and performed by two persons instead of one, the method has much to recommend it.

In the matter of detail, most of the implements were faulty. The majority were hollowed out too deeply, getting chokeful with bone and skin, which it took some time to extract, when with the ordinary pole-axe two or three bullocks might have been killed. By a peculiar oversight, also, most of the punches were larger at their extremity than at the base, and stuck in the heads of the oxen slaughtered, a very serious objection when a few seconds of time is an important matter. There does not hitherto appear to be any great improvement on the ordinary method.

New Granges of Patrons of Husbandry.

Since our last issue the following new Granges of Patrons of Husbandry have been formed in the Dominion.

Division Granges.

7. LUCKNOW.—W. Patterson, Master, Lucknow; John Taylor, Secretary, Kinloss.

8. BRANTFORD.—John S. Thompson, Master, Brantford; Geo. Bellachey, Jr., Secretary, Brantford.

9. TORONTO.—J. P. Bull, Master; A. H. Hughes, Secretary.

Subordinate Granges

123. MOUNT HOREB, County of Peel.—Eli Crawford, Master, Brampton; James Sinclair, Secretary, Brampton.

124. DALSTON, County of Simcoe.—Wm. Hickling, Master, Dalston; Joseph Drury, Secretary, Dalston.

125. ROSE HILL, County of York.—James H. Beynon, Master, Temperanceville; James Rogers, Secretary, Eversley.

126. MINESING, County of Simcoe.—Richard Dixon, Master, Minesing; John Johnston, Secretary, Minesing.

127. ARNOW, County of Bruce.—John Shier, Master, Arnov; Benjamin Smith, Secretary, Arnov.

128. MILTON, County of Halton.—George Brounridge, Master, Milton West; Henry Wilmott, Secretary, Milton West.

129. TREADWELL, County of Middlesex.—Wm. Murdoch, Master, Napperton; Charles Rapley, Secretary, Napperton.

130. EDMONTON, County of Peel.—John Cation, Master, Edmonton; John Watson, Secretary, Edmonton.

131. GRIMSBY, County of Lincoln.—D. Nixon, Master, Grimsby; Jonathan Carpenter, Secretary, Arkona.

132. ARKONA, County of Lambton.—Stephen Cornell, Master, Arkona; Jacob Wintermute, Secretary, Arkona.

133. CROWS HILL, County of Simcoe.—John Darby, Master, Barrie; Thos. Drury, Jr., Secretary, Barrie.

134. SNOWDROP, County of Huron.—John Jameson, Master, Laneville; Joseph Bell, Secretary, Lucknow.

135. KELVIN GROVE, County of Lambton.—William Auld, Master, Warwick; J. Thomson, Secretary, Warwick.

136. BLOOMFIELD GRANGE, County of Kent.—Henry West, Master, Chatham; Francis Dolsen, Secretary, Chatham.

137. METCALFE VICTORIA, County of Middlesex.—S. W. Dell, Master, Strathroy; John E. Laughton, Secretary, Strathroy.

138. BERFORD GRANGE, County of Brant.—R. S. Gage, Master, Mount Vernon; W. F. Miles, Secretary, Mount Vernon.

139. TEEF BLUE, County of Middlesex.—Jacob Molmer, Master, Sable; Murdoch McDonald, Secretary, Sable.

140. RUSSELLDALE, County of Perth.—John Cole, Sr., Master, Russeldale; Richard Gill, Secretary, Russeldale.

141. KNOCK, County of Simcoe.—T. Connol, Master, Stroud; Wm. Hunter, Secretary, Craigvale.

142. MAPLE GROVE, County of Durham.—R. D. Foley, Master, Bowmanville; Richard Foley, Secretary, Bowmanville.

143. SOMERVALE, COUNTY OF PERTH.—R. H. Bain, Master, Fullarton; W. J. Phipps, Secretary, Fullarton.

144. TOTTENHAM, County of Simcoe.—George Nolen, Master, Tottenham; Robert W. Lowery, Secretary, Tottenham.

145. NELSON, County of Halton.—Abraham Stinson, Master, Nelson; David Sinclair, Secretary, Nelson.

146. PAISWICK, County of Simcoe.—William H. Hewson, Master, Paiswick; William Hunter, Secretary, Paiswick.

147. NORFOLK, County of Norfolk.—Isaac Austin, Master, Port Dover; D. B. Palmerston, Secretary, Simcoe.

The Bingley Hall Sale of Shorthorns.

The Spring sale-show of shorthorns at Bingley Hall, Birmingham, has grown to be one of the great agricultural events of the year. When started in 1868, 45 animals were entered; in 1873, there were 176 entries; of 1874, 252; this year the number was 396. A feature of these sales is that no greater reserve than twenty guineas is to be put on any animal. The consequence is that no animals of ultra-fashionable blood are sent, but the sale has become a place where a tenant farmer may be certain of picking up good serviceable animals fit to go into company but the very best. Prizes amounting to £280 were distributed among the exhibitors. The best prize, £60, was taken by Colonel Lloyd Lindsay, M.P., for a bull exceeding ten and under twenty months old.

Among the principal purchasers were G. Fox, Esq., Harefield, Wilmslow, who bought Mr. John Hardy's cow Fauna Gwynne, at 235 guineas; Mr. Russell, New Zealand, who took twelve young bulls, several being prize winners, at prices from 40 to 120 guineas, the twelve costing nearly £1,000; Mr. Thornhill, who selected twenty cows, all good roans with plenty of hair, at about 40 guineas each; Mr. Gordon of Invergordon, a very judicious, yet spirited buyer, who took some of the best heifers; also Messrs. Hope and Richardson, for Canada; Messrs. Farmer and Groom, for New Zealand; Earl of Warwick, Earl Beauchamp, Lord Calthorpe, Marquis of Anglesea, Lord Leigh, Lord Ernest Seymour, Lord Manvers, &c. With the exception of the Class 6, where the bulls competed for the £100 prizes, and were started at 50 guineas, and some inferior young calves, from six to ten months old, which should not have been sent, the whole sold remarkable well, though there were two or three fashion-

ably-bred young bulls picked up at much under their value. It is noticeable that a much larger number of the leading breeders attended the sale than usual, and several were also purchasers, amongst whom we noticed Messrs. Graham, Garne, Fawcett, Canning, Atkinson, Bult, &c.

The following is a complete summary of the sales:—

Class.	No. Sent.	No. Sold.	Highest Price.	Average.	Total.
			£ s. d.	£ s. d.	£ s. d.
1	23	23	246 15 0	54 17 6	1262 2 0
2	9	9	46 4 0	36 10 4	328 13 0
3	19	18	94 10 0	39 16 10	717 3 0
4	30	30	79 16 0	36 7 4	1091 0 0
5	9	9	63 0 0	45 3 0	406 7 0
6	23	13	78 15 0	52 2 0	677 6 0
7	50	48	110 5 0	38 19 8	1871 2 0
8	71	68	120 15 0	38 14 3	2632 7 0
9	139	89	157 10 0	36 3 0	3217 4 0
	373	307	246 15 0	39 15 0	12203 4 0

Class 1 consisted of cows over three years old; Class 2 of heifers between two and three years; Class 3 of heifers between one and two years; Class 4 of bulls between 20 and 36 months; Class 5 of bulls over 3 years; Class 6 of bulls 10 to 20 months; Class 7 of bulls 15 to 20 months; Class 8 of bulls 12 to 15 months; and Class 9 of bull calves under 12 months.

The Short-Horn Society of Great Britain.

The following is the effect of resolutions passed at recent meetings of the Short-horn Society of Great Britain.—The Herd Book is to be published annually; the back volumes to be sold to members at one guinea per volume, (the publishing price), and at £1. 11s. 6d. to non-members; the price of entries to members to be for bulls 5s. each entry, and for cows with their produce 2s. 6d. each entry, and to non-members for bulls 10s. each entry, and cows with their produce 5s. each entry; pedigrees not accepted to be returned with the fees; the price of the current volume of the Herd Book to non-members to be £1. 11s. 6d.; entries of bulls may be made by owner or breeder; the number of crosses required in any bull before entry in the Herd Book to be five, and in any cow four crosses; the 400 entries of bulls sent to Mr. Strafford for entry in the last vol. of the Herd Book (vol. 20) to be accepted, their corrections being verified by Mr. Strafford; an advertisement to be issued at once setting forth these particulars, stating that the society is now prepared to receive pedigrees for insertion in the forthcoming volume of the Herd Book, and giving information as to forms, &c.

The numbering of bulls on the present system will continue until six figures are reached.

Residents in America, the Colonies, or on the continent of Europe, are to be eligible for election as members of the Society, and be entitled to its publications, but without the privilege of entering their cattle in the Herd Book.

Ayrshire Breeders' Association.

The Ayrshire breeders at their late convention at Albany, N. Y., perfected their organization. The annual meeting is fixed for the third Thursday in January. Twenty members are to form a quorum. Voting is to be in person or by proxy. The initiation fee is \$10, that figure having been carried after a vigorous attempt to make it \$15. Two classes of thoroughbreds are made eligible to registry—those imported or tracing to importation; and those in whose pedigrees a link is missing but which are believed to be pure-bred. In the first case the numbers to be numerals, in the second to be Roman capitals. No doubling of names is to be allowed, and the affix 1st, 2nd, 3rd, &c., shall only be given to the calves of the cow bearing the name used, and not to her grandchildren, or any other animals. Transfers of animals are to be recorded, and transfer books to be kept by the editor. A death record to be also kept by the editor of the Herd Book, recording deaths of animals and the causes so far as known. The breeder of an animal shall be considered as the one owning the dam at time of service by the bull.

After considerable discussion a proposition to accept Messrs. Sturtevant's North American Ayrshire register, they agreeing to add a supplement to the volume, was tabled. The Secretary of the Association is J. R. Stuyvesant, Poughkeepsie, N. Y.

THE HORSE SHAMBLES of Paris supplied the public during the third quarter of the past year with nearly 630,000 lbs. of meat, the result of the slaughter of 1,555 horses, mules and asses.

The Glasgow Stallion Show.

The annual show of stallions at Glasgow, Scotland, is an agricultural event which has sprung from a very small beginning into one of the most important gatherings of the year. The Fuld gives a history of its rise. In the Spring of 1861 the Society offered a premium for an entire horse for the district, one belonging to Mr. Riddell, Kilbowie, having been selected. The following year a competition for the prize, and three animals came forward. Mr. Riddell was again successful. Since then the competition has been continued every year, and the number of entries has steadily increased until this year, when 185 horses assembled. What has principally conducted to the extraordinary rise in the entries is the custom of representatives from different farmers clubs throughout the country attending the Glasgow meeting for the purpose of selecting horses for their respective districts. This year about forty deputations were present, and engaged horses for the season, giving them premiums ranging from £50 to £100, with a guarantee of a certain number of mares on favorable terms. The Glasgow Society secures for itself the first-prized horse in the aged class, and the deputations are free to arrange among the others as they best can.

Clydesdale Breeding in Scotland has grown in popularity, and is apparently increasing. The Clydesdale is admittedly the best sire for a farm stud. The great rise in the price of horses has stimulated farmers in breeding, and the encouragement given to this valuable breed of horses by the Glasgow Agricultural Society has aided in the improvement of the Scotch farm horses. The best animals in the country are annually attracted to the Glasgow meeting, and there the agricultural clubs throughout the country have facilities for selecting worthy sires, which are no where else obtainable.

Mr. J. H. Gardner's Sale of Short-horns.

This sale was originally held in March, but from the blockaded state of the roads, but few buyers were present, and they handsomely relinquished their purchases to allow Mr. Gardner a better chance. The second sale was fixed for March 31st, when almost impassable roads again made the attendance very thin. The sales were:

Table listing items and prices for Mr. J. H. Gardner's Sale of Short-horns, including Victoria, Garbutt & McKay, Toronto; Lily, H. Snell, Clinton; May Queen, J. Armstrong, Vaughan; Flora, F. Lundy, Toronto; Dairymaid, H. Snell; Favorite, W. Moore, Toronto; Lady Dufferin, H. Snell; Annie, J. Snell, Edmonton; Minnie, H. Snell; Beauty, Garbutt & McKay; Emma, W. Wilson, Esquimaux; Lady Queen, W. Moore; Gladstone, H. M. Matheson, Stuyver; Champion, J. Jackson, Chinguacousy; Alexander, E. Hillier, Chinguacousy; Commodore, W. C. Smith, N. W. Hamburg; Canadian Lad, J. Armstrong; Captain, G. Gooderham, Chinguacousy; Royal George, G. Bell, Scarborough; Favorite, W. C. Beattie, Trafalgar.

The average of 12 cows and heifers was, \$149.58; of 9 bulls and bull calves, \$9.11. Total sales, \$2,615.

The Bellevue Herd Sale.

The sale at Franklin Grove, Ill., on March 24th, of the Bellevue herd of short horns belonging to Mr. Wm. Stewart, was well attended and was a grand success. Seventy-nine animals realized \$24,550, an average for the bulls and bull calves of \$276.33, and for cows and heifers of \$318.83. The following is a list of the animals which brought the best prices:

Table listing items and prices for The Bellevue Herd Sale, including 2nd Lady of Racine, R. H. Austin, Sycamore; Miss Wiley of Bellevue, R. H. Austin; Mary Alice, M. Miller, Rochelle; 1st Duchess Louan, R. H. Austin; Bloom 12th, J. C. Lehman, Franklin Grove; Caroline 6th and c. e., M. P. Clark, St. Cloud, Minn; Moselle, R. H. Austin; Hazel Queen 1st, Greco & Morton, Cedar Rapids, Iowa; Donna Lee, Wm. Piper, Rochelle; Roxy, H. Van Patten, Stewart; Elsie, Wm. Chambers; Hanna Princeton, Hawkes & Moore; Violet 2nd, Wm. Chambers; Lily of Taylor, same; Josephine, E. A. Snow, Dixon; Luella, J. Highberger, Peconica; Gold Ring, G. Huff, Meriden; Red Rose 3d, withdrawn; Mary 6th, W. W. Tilton, Dixon; Mary Leonidas, C. Dement, Dixon; Jennie Turner 2d, W. M. Smith; Hope, A. Tucker, Dixon; Fancy, Wm. Chambers; Violet, C. Dement; Florence, J. Highberger.

Table listing items and prices for Lord Wiley, A. Powers, Dixon; Louan's Thimble, N. Cornell, Dwight; Earl Duchess, M. McWilliams, Darlington, Wis.; Duke of Thimble, Wm. Noel, Paxton; Champion of the West, bid in at \$1000; Major Renick, D. Sheaff, White Rock.

Sale of the Glen Flora Herd.

The sale of Mr. C. C. Parks' famous Glen Flora herd, at Waukegan, Ill., on April 7th, drew together a large crowd of breeders from all parts of the continent. The bidding was spirited, and the prices realized fair. The sale was conducted with remarkable celerity by Col. Judy, who occupied the rostrum for only four and a half hours. The following were the principal sales:

Table listing items and prices for Sale of the Glen Flora Herd, including Rose of Oxford 2nd, Col. J. Taylor, London, Ont; Princess of Oxford 4th, Simon Beattie, Whitevale, Ont; Princess of Oxford 7th, N. P. Clark, St. Cloud, Minn; Atlantic Gwynne 2nd, George Grimes, Bournemouth, O; Oxford Gwynne 2nd, George Grimes; Oxford Gwynne 3rd, John R. Craig, Burnhamthorpe, Ont; Oxford Gwynne 5th, J. K. Craig; Oxford Gwynne 6th, George Grimes; Oxford Gwynne 7th, Albert Crane, Durham Park, Kan; Oxford Gwynne 8th, George Grimes; Oxford Gwynne 9th, George Grimes; Jubilee Gwynne 2nd, George Grimes; Jubilee Gwynne 4th, J. R. Shelly, Shannon, Ill; Jubilee Gwynne 5th, Col. R. Holloway, Monmouth, Ill; Princess Gwynne 7th, J. R. Shelly; Princess Gwynne 8th, William Miller Atha, Ont; Melody Gwynne 11th, J. R. Shelly; Lady Oxford 2nd, George Grimes; Pearl Fairview, Mr. Megibbon, Cynthiana, Ky; Peri's Duchess, U. P. Clark; 2nd Rose of Racine, H. F. Brown, Minneapolis, Minn; Flattery 4th, Mr. Shelly; Bright Eyes 8th, Robert Holloway, Monmouth, Ill; Oxford Bloom, J. R. Shelly; Oxford Bloom 2nd, W. N. Smith; Oxford Bloom 3rd, George Grimes; Oxford Bloom 4th, and calf, Mr. Megibbon; Oxford Bloom 5th, George Chase; Oxford Bloom 7th, Mr. Megibbon; Victoria of Glen Flora, Mr. Megibbon; Fourth Victoria of Glen Flora, T. J. Megibbon; Frantle 13th, Simon Beattie; Frantle 27th, Simon Beattie; Friendship and calf, John R. Craig; Irene 9th, J. B. Taylor; Miss Wiley of Woodlawn, Rigdon, Huston; Fourth Earl of Oxford, 8075, Bailey & Goodspeed, Baldwin, Wisconsin; Baron Bates 1st, 11332, George Utley; Mazurka's Duke of Aldrie, George W. Rust, Chicago; Baron Belleville, Elliott, Ill; Baron Bertram 6th, George Harding, Waukesha, Wis; Royal George, 18799, J. N. Gridley, Half Day, Ill.

The following is a summary of the animals disposed of: Cows, 103; average price, \$670.50. Bulls, 17; average price, \$296.17.

Sale of the Linwood Herd.

The third annual sale of the Linwood Short-horns, owned by J. H. Kissinger, came off at Dexter Park, Chicago, on April 9th. Forty-two head were sold, realizing an average of \$452. The best prices realized were as below:

Table listing items and prices for Sale of the Linwood Herd, including Illustrious 3rd, Pearce & Son, Tallulor, Ill; Louan Lesley, A. Crane, Durham Park, Kan; 2nd Countess of Corinthia, and Master Breastplate, Simon Beattie, Whitevale, Ont; 3rd Louan of Linwood, George Ottley, Neponset, Ill; Mazurka of Linwood, Ed. Hes, Springfield, Ill; Queen of the Meadows 2nd, S. W. Ficklin, Charlottesville, Va; Miss Wiley, of Linwood, A. Crane; Phoebe Taylor, J. H. Potter & Son, Sack-onville, Ill; Orphan Gwynne, George Ottley; Vanha 3rd, J. R. Shelly, Shannon, Ill; Lady Fairy, A. W. & W. Pickrell; Calla 20th, J. S. Latimer; Calla 21st, Robson Bros., Wataga, Ill; Cassa 18th, W. Warwick, Cynthiana, Ky; Cassa 17th, Robson Bros.; Cassa 18th, Rigdon Huston, Blainville, Ill; Queen Charlotte 16th, George Ottley; Queen Charlotte 6th, H. Thompson, Winchester, Ky; Mattie Gerrard, J. R. Shelly; Kissinger's Breastplate, 17476, Ed. Hes; Red Duke of Linwood, 18118, W. Rhodes, Salem Station, Wisconsin.

Sale of the Elm Grove Short-Horns.

Elliott & Kent's Elm Grove herd of Short-horns were sold at Dexter Park, Chicago, on April 8th. The total amount realized was \$31,000. Forty-eight cows averaged \$646.87; fourteen bulls averaged \$207. The herd-books of the firm were bought by F. W. Jacobs, of Iowa, for \$90. The principal sales were:

Table listing items and prices for Sale of the Elm Grove Short-Horns, including Imported Fril, Meredith & Son, Cambridge City, Ind; Young Mary, same; 4th Tuberosa of Brattleboro', Col. L. P. Muir, Paris, Ky; 2nd Red Rose of Brattleboro', Capt. W. S. Innes, Paris, Ky; 28th Lady of Putney, T. L. Megibbon, Cynthiana, Ky; 39th Lady of Putney, George Grimes, Brownsville, O; 37th Lady of Putney, J. R. Shelly, Shannon, Ill; 5th Tuberosa of Brattleboro', Capt. S. Simmes, Paris, Ky; Tuberosa of Brattleboro', H. B. Thompson, of Winchester, Kentucky; 13th Lady Sale of Brattleboro', George Grimes; Melody Gwynne 6th, Pmgrey & Sons, Blairstown, Ia; Jubilee of Woodlawn, A. Crane, Durham Park, Kan; Jubilee of Elm Grove, A. Ludlow, Monroe, Wis; Mazurka Duchess 2nd, A. Ludlow.

Table listing items and prices for Louan 3rd of Elm Grove, J. S. Latimer, Abingdon, Ill; Louan 4th of Elm Grove, or Greenwood Louan 2nd, A. M. Bowman, Waynesboro', Va; Louan 6th of Elm Grove, or Greenwood Louan 19th, A. Crane; Phoenix 1st of Elm Grove, Sol. Meredith & Son; Phoenix 2nd of Elm Grove, Abner Shing, Ottawa, Ill; Phoenix 3rd of Elm Grove, H. H. Corbin, Paris, Ky; Phoenix 4 h of Elm Grove, Abner Strong; Jenny G'Gaunt 2nd, A. M. Bowman; Red Rose, Abner Strong; Princess Ada 3rd, H. H. Corbin; Baron Bates of Elm Grove, J. K. Brower's Sons, Berlin, Ill; Mazurka's Baron Hubback, A. M. Bowman; Phoenix Duke, James Ingham, Kewaunee, Ill.

A BRAHMIN cow and her calf, by a Jersey bull, are offered for sale in the Country Gentleman's advertising columns.

THE MARKHAM and Whitchurch Agricultural Societies have amalgamated for a Union Hall Show to be held in Stouffville on Oct. 5 and 6.

MESSRS. BEATTIE & MILLER will sell at Toronto in June next an extensive collection of Short-horns, Clydesdales and Berkshires.

THE SEED CATALOGUE of Mr. George Rennie, of Toronto, for 1875, contains the information and price lists that farmers are seeking for at this time of the year.

WE ACKNOWLEDGE receipt of the Transactions of the Massachusetts Horticultural Society for 1874, which is as valuable as the records of that Society invariably are.

THE STALLION Abdallah, valued at \$30,000, was killed in Paris, Ky., on April 5, by coming into collision with a passing team, the shaft of which pierced his breast.

THE ATTENTION of those Canadian farmers who have a running stream of cold water, is directed to the fact, that Canada brook trout are quoted in the New York markets at thirty to fifty cents a pound.

WE HAVE received the catalogues of Storrs, Harrison & Co., Painesville, O., fruits, shrubs, plants, trees, etc.; and the Bellevue Nursery Co., Paterson, N.J., plants, garden and flower seeds, etc.

THE MARYLAND FARMER, one of the best and most practical of our exchanges, announces the accession to its editorial corps, of Prof. J. Wilkinson, a gentleman already favorably known to its readers.

AT THE SALE of Mr. Smith's Short-horns, at Islanmore, Ireland, lately 46 cows and heifers brought an average of £36 8s. 4d. Mr. Downing's Farewell 2d, brought 330 guineas; and Mr. Smith's Brigantine 230 guineas.

AN ULSTER CO., N. Y., correspondent of the Country Gentleman, says that he weighed a lamb as soon as dry after being dropped, and his weight was fourteen pounds, quick. His lambs are by a pure Cotswold ram from very large Canada ewes.

THE CELEBRATED Short-horn bull, 9th Earl of Oxford, 17024, the property of S. S. Brown, Galena, Ill., lately died from pneumonia. This was one of the best living representatives of the fine Oxfords, and is not only a serious loss to his owner, but to the Short-horn world.

GEO. LESLIE & SONS, of Leshe, Ont., issue a catalogue which not only contains the usual price lists, but, in addition, has a large amount of information on topics connected with horticulture in all its branches. We recommend those of our readers who have not already got it, to send for it.

THE LONDON Agricultural Gazette mentions with just approve: "Mr. Grant, of Elchies, Speyside, who has recently, for the fourth or fifth time in the course of the last eight years, purchased three valuable young Shorthorn bulls for the gratuitous benefit of his tenantry." If there were more of this kind of landlords around, we should hear less of tenant-right.

MR. Wm. DOLBY, whose manner of expressing himself seems to indicate a Milesian origin, writes to the Mark Lane Express to contradict a rumor that the Short-horn bull, Leeman, was dead; "he has never known an hour's illness, and is doing wonderfully well, and much improved." To complete the "bull," the Express adds that the report never appeared in its columns.

"THE CANADIAN FARMER'S Manual of Agriculture" advertised in our columns, has been lately transferred to Rogers & Larnie, of Toronto, from whom it may now be obtained. The price is reduced to \$2.50. It is a useful volume, principally compilation and extracts from the agricultural press. The extracts are made with judgment and care. The book contains a great deal of information in a small compass.

THE LOSS to the sheep interests of the United States by the depredations of dogs is summed up by the Department of Agriculture reports, at 2 per cent. per annum of the entire number of sheep in the country. It is shown that in those States where stringent dog-laws exist, the destruction is much smaller than in the unprotected States. In Florida, where there is no dog-law, 11 per cent. of value were destroyed; in Ohio, which has a dog-law, only four tenths of 1 per cent.

ONTARIO POULTRY SOCIETY.—At the annual meeting of this Society the following gentlemen were elected officers for 1875-6—President, E. Morris, Guelph; 1st vice-do., Jas. Goldie, Guelph; 2nd vice-do., D. Allen, Galt; Secy.—Treas., Geo. Murton, Guelph. Executive Committee.—The President, vice-Presidents, Secretary, and Messrs.

Sturdy of Guelph, Jarvis of London, Aldouse of Berlin, Thomas of Brooklin, and Rev. W. F. Clarke. The next show was fixed to take place at Guelph, in the first week of March, 1876.

The *Mark Lane Express* thinks that the live stock traffic between this continent and England is not likely to succeed.

MR. ANDERSON'S JERSEYS which were sold on March 2nd, at Staines, England, 77 in number, brought £1,815—average £23 19s. 4d.

THE 9TH EARL OF OXFORD, the last but one of the pure Oxfords, died at Galena, Ill., lately. He belonged to Mr. S. S. Brown of that place.

THE 4TH DUKE OF HILLHURST, aged 3 months, has been sold by Hon. M. H. Cochrane of Compton, to Robert Hollway, of Monmouth, Ill., for \$7,000.

A DAIRYMAN in Scotland has a cow which dropped triplets in 1874 and twins this year, making five calves in 12 months—all alive and thriving.

MR. GEDDES, one of the most noted of Scotch agriculturists died at his residence at Fockabers, Morayshire, lately. He was well known in the Short-horn world.

GEO. GEDDES states, in the *Country Gentleman*, that Sam. Thorne made the Short horn bull, 2nd Duke of Thorndale, weigh 2,000 pounds the day he was two years old.

THE HEIFER BELLE DUCHESS, purchased by J. W. Wadsworth, Genesee County, N. Y., from Col. King, for \$4,500 has given birth to a red and white bull calf by 2nd Duke of Hillhurst.

THE 3RD DUKE OF ONEIDA has been sold by Mr. George Grimes of Ohio, to Messrs. Ware & McGoodwin for \$12,000. In July, 1873, a half interest in this bull was sold for \$3,300.

THE ROYAL AGRICULTURAL SOCIETY has rescinded its lately passed rule directing that judges of stock at their exhibitions shall be furnished with catalogues with pedigrees, making pedigree an element in the award of premiums.

IT IS EASY to believe a statement made in the English agricultural press that the farm labourers in North Britain, who receive \$6.25 per week, are more profitable to their employers than are the Southern labourers, who get \$3.00 less, to their employers.

AN "OLD AND EXPERIENCED BURNER" who slaughtered a fat heifer in Morayshire, Scotland, that had been fed upon wheat at the rate of six or seven pounds a day, found the flesh "hard as a stick," although good looking and well flavoured. He gave as his verdict that "the wheat did it."

MR. T. HARRISON'S short-horns, at Leven Hall, Garth, England, were sold lately. The herd is remarkable as having been reduced down to nine by the rinderpest in 1866. From those nine, the present herd was bred. The top price was \$6 guineas, given for the heifer Caroline by Mr. Pybus. Forty-seven cows averaged £42; fourteen bulls averaged £22. A flock of Leicesters brought £1,114.

MR. COWAN'S SHORT-HORNS, which were sold at Galt, lately, brought the total sum of \$3,908. The average price of bulls was \$122.50; of cows, \$165.00; of heifers, \$93.66. The highest price realized was \$400 for Rose's Oxford, bought by J. Smith, Toronto. The highest price given for a cow was \$250, for Africa, by H. Smider, Waterloo; for a heifer, \$150 for Ida, by E. Shantz, Waterloo.

ONE OF THE RECENT NUMBERS OF THE FARMERS' UNION was pervaded by a strong odor of prime beef, for which we could not account until we noticed a paragraph wherein the editor explains that one of Col. King's Short-horns, which cost \$2,000 as a calf, had turned out barren, and therefore had to be converted into beef. The verdict of the Minneapolitans is that any one who thinks scrub steaks are equal to thoroughbred, should be written down an ass.

SOME WARWICKSHIRE FARMERS recently caught it heavily at the Stratford-upon-Avon Petty Sessions, for exposing newly-shorn sheep to the inclemency of the weather in February last. Some pretence had been made at furnishing the poor animals with jackets, but there appeared to be a lack of uniformity in the wearing of them. Some of the sheep had the jackets drawn under their bodies, on some they were twisted like ropes, and from some they were blown off altogether. The farmers were fined £3 each and costs.

THE BREEDING OF stock has received much attention in all parts of India. Great pains have been taken, especially in Madras, to improve the native sheep, and sheep have been introduced into the Panjab and the Northwest Provinces from England, while shows and prizes have stimulated the breeding of cattle. The Government studs have been found insufficient to supply the army with a sufficient number of mounts, and the Home Government have therefore decided to encourage private enterprise; and the breeding of horses for the market will probably again revive. India also receives foreign supplies from the Persian Gulf, Central Asia by Kabul, Australia, the Cape, and England. Instead of Government studs, it is proposed that stallions be furnished in the best breeding districts, that prizes be offered for promising brood mares and young stock, and that liberal prices be given for suitable three or four-year-old colts.

Seeds.

Golden Globe vs. Red Chaff.

EDITOR CANADA FARMER:—What I claim for the Golden Globe wheat is, that it is as hardy as the Red Chaff (recommended in the January number of the FARMER, notwithstanding its admitted inferior milling qualities), while the former yields at least one-third more to the acre, and makes as good flour as Fife or Club. We can not raise "bright, first-class wheat" on our poor clay land, and are therefore glad to have a hardy production, yet saleable,—wheat we can raise. S. GOING.

Wolfe Island, Ont.

The Snowflake Potato.

HAVE ANY OF THE CANADA FARMER readers had experience with the new Snowflake Potato which is advertised to give such wonderful crops? I have heard of some persons who think it the best thing out, and I want to know something about it before investing in it. It is so dreadfully easy to get humbugged now-a-days that it will not do to suck in everything we read about. I like the idea of having these newly-introduced varieties talked of in the CANADA FARMER columns, and will engage to give my brother farmers all I find out, in return for items of their experience. Lambton Co., Ont. AGRICOLA.

The Smith Wheat.

EDITOR CANADA FARMER:—Will you please answer me these questions:—1. Does the Smith wheat have a glassy straw? 2. Is it a bald head? 3. From experiments thus far, what is the average yield? 4. Where can it be obtained? 5. What is the price? 6. What kind of soil is best adapted to its cultivation? J. MCKEE.

Rock River, Minn.

1. We have not seen the straw of the Smith or Egyptian wheat yet, and so cannot say whether it is glassy. The ear has a peculiar habit of branching. 2. The head is slightly bearded. 3. The introduction is so recent that the average yield cannot be stated. It yielded sixty bushels last year, but of course that cannot be claimed as the average yield. 4 and 5. The price asked was \$14.00 per bushel, early in the season. We understand that it is all sold and therefore it cannot be obtained. A rich, heavy soil is best suited to it.

FULTZ WHEAT.—The Fultz wheat grown the past season upon the experimental farm of the Pennsylvania Agricultural College, at West Grove, Chester County, Pa., has yielded at the rate of forty-two bushels per acre. The next highest products were the Brittany and Red wheat, 37, 44-60 bushels; Rough and Ready, 34, 52-60; and White Chaff Mediterranean, 34, 40-60 bushels.

WANTED, A PEA!—It is the *Rural New-Yorker* that wants it. This is the sort of pea it wants.—A pea that shall be green in color when mature, and that, when cooked in mid-winter, shall retain all the luscious excellence and flavour of the best of peas cooked green. Cannot such a pea be secured? The near approach to it which is found in some varieties warrants the hope, if not the belief, that such a pea will yet be produced. We need a better class of peas in this country than we have; and considering their nutritive character as food for both men and brutes, we ought to grow and use more of them.

WITLOOF.—A NEW SALAD.—The Belgians cultivate a variety of chicory which has a close head similar to cabbage or lettuce. The name "Witloof" means "Whiteleaf." In Brussels, the heads of the Witloof are cooked whole, and eaten with white or cream sauce; but it is equally good as a salad. It is all the more valuable on account of its being obtainable at a season when other vegetables are comparatively scarce, the markets of Brussels being supplied with it from Christmas till Easter, and later. The seeds of this variety are sown during the first fortnight of June, in good and rather deep garden soil. The only care to be taken is not to crowd the plants too much. The roots should be about 4 inches apart, in order that they may be thoroughly developed, for upon the size of the roots the beauty of the head in a great measure depends. Attention is being directed to this new salad in England. Probably our own people will soon be able to tell us something about it.

The Japanese Pea.

EDITOR CANADA FARMER:—Can you inform me whether the wonderful Japanese pea now advertised in some papers is a sham or a reality. Subscriber. Goderich, Ont.

We cannot say that the Japanese pea is a sham; but the claims made by the advertisers are certainly ridiculous exaggerations. It will not succeed in Canada, however it may flourish in the Southern States.

The Extra Early Vermont.

EDITOR CANADA FARMER:—That correspondent is a little off the track when he avers that the Extra Early Vermont and the Early Rose are one and the same potato. I have grown the Vermont, and though it resembles the Early Rose closely, it is quite distinct from it. Probably your correspondent planted his Vermonts on some ground on which Early Rose had been grown the year before, and from which they had not been harvested cleanly. Or, mayhap, he is not much of a judge of potatoes. GARDENER.

Ontario Co., Ont.

Experiments with New Potatoes.

A New York State correspondent of the *New York Tribune* gives in tabular form a statement of results of a test last season of fifteen prominent sorts of potatoes, promising that a pound of each variety was planted—

Name	Yield, pounds.	Rate per acre, bbls
Early Vermont.....	130	42
Early Rose	88	50
Early Favorite.....	40	23
Ice Cream.....	100	65
Snowflake.....	180	100
Brownell's Beauty.....	142	103
No. 23.....	189	111
Carpenter's Seedling.....	135	66
Peerless.....	165	90
Thorburn's Late Rose.....	162	85
Compton's Surprise.....	87	82
Perchblow.....	45	38
Ohio Beauty.....	289	167
Standard.....	247	154
Campbell's Late Rose.....	90	51

You will observe, says the correspondent, that my results bear no comparison to the reports made by the Bliss Committee. [CANADA FARMER for February] I cut my seed as small as it could well be done, often quartering an eye, and gave the plants every possible care; the ground was as good as anybody's, and the season was fairly favorable for most sorts. Now, how a yield of 900 to 1 can be obtained by ordinary methods of planting and culture, as they are limited to by the conditions, I can't understand. I don't say that I dispute the reports made. I have no evidence to do that, but I cannot divest my mind, as a potato-grower of a certain degree of experience and skill, that there is a hitch in the business somewhere. Is it in the possibilities of "ordinary field culture" to accomplish such enormous yields? I know that Dietz, of Pennsylvania, years ago, raised a ton of Early Rose from a pound of seed, one season, but it was by raising two crops; and that O. Burras, of Ohio, obtained a \$100 prize by the sharp practice of starting the eyes in a forcing bed and transplanting the shoots as fast as they grew (a la sweet potato).

RICKETT'S SEEDLING GRAPES.—President Barry, of the Western New York Horticultural Society, is reported as remarking, in relation to these grapes, that "in his opinion they were the greatest acquisition the country had ever had."

EARLY TOMATOES.—Hubbard's Curled Leaf is the earliest variety we have ever grown in our garden, but its earliness and productiveness are its only merit, as the plants have a withered and unsightly appearance, and the fruit is small and watery. Gen. Grant is quite early and good, as well as Canada Victor; but of all the early varieties we have cultivated, Hathaway's Excelsior has proved the most satisfactory on our soil, which is a gravelly loam.—*Cor Rural New Yorker*.

THE CONNOISSEUR PEA is thus spoken of by one who tried it last year on limestone soil, scarcely any rain falling during its growth after sowing:—"After all the other peas were dead, Connoisseur was as 'green as a leek.' It was a perpetual bloomer and cropper, commenced to fill in July, and bloomed until October. I have heard that there is a difficulty to grow peas in hot climates, but I fancy we have one in Connoisseur that will be of great service abroad, and also to those that require peas, say in October."

Correspondence.

GRAFTING.—John D. Ellis.—The March number contained full directions for grafting.

ORCHARD GRASS.—J. R., Goderich, Ont., and G. S. McT., Madock, Ont.—Orchard grass may be obtained from any of the seedsmen advertising in our columns. Its price in Toronto is 40 cents per pound.

SEED PEAS.—A. J. Dugger, Highland, Ill.—Canadian field peas for seed can be procured from Mr. Wm. Rennie, Toronto. The price will be about eighty-five cents per bushel, and they will be subject to a duty of twenty cents per bushel.

SILVER-HULLED BUCKWHEAT.—We have an enquiry from a correspondent for Silver-hulled buckwheat. Probably some of the seedsmen advertising with us have the article. A special mention of it in our advertising columns would be advisable.

BOUND VOLUMES.—E. B., Brantford, Ont.—We can supply the bound volumes of the CANADA FARMER for any year during its existence, except 1871. The price is \$2.00 per volume for the 1873 and 1874 volumes; \$1.50 per volume for the remainder.

LICE ON APPLE-TREES.—J. D., Dalhousie, Ont.—To keep lice off apple-trees, wash the trunks over with a compound made of soft, soap water and lime, in the proportion of one part of soap to four of water, using enough lime to bring the mixture to the consistency of whitewash. Apply with a brush.

FRENCH HORSES.—Reader, Scott Township.—Montreal would be the best place in Lower Canada at which to get the large stand best bred French horses. We do not know the price of a good one now, but it is much higher than it was a year ago. Can some of our readers tell our correspondent more about them?

CORN-PLANTER.—There is no corn-planter by horse-power manufactured in the Dominion that we know of. There are several such implements in use in the Western States. We do not think they would be of any value on the small fields of corn which Canadian farmers plant. In the hundred-acre corn fields of Illinois, it is a different matter.

APPLYING SUPERPHOSPHATE TO CORN.—The superphosphate should be applied as nearly in contact with the seed as possible. It will not be absolutely lost if it is scattered about, but the roots of the plant will not find it and it may not be utilized for years. With corn, apply the superphosphate to the hill, dropping the corn directly upon it. Use about a good handful to each hill, which will use up about two hundred pounds to the acre. Sown broadcast for other crops, about 400 lbs. to the acre will be found about right.

FENCE POSTS HEAVING.—Reader, Renfrow, Ont.—We presume that the reason for the heaving of fence posts is that the frost expands the water in the soil—water expanding about one-eighth in bulk while in the act of freezing. This lifts the posts, and on thawing the dirt gets under and keeps them from settling back. We should judge that fence posts sharpened at the end, are more liable to be heaved by frost than those put down with square ends. Some persons bore an inch auger hole through the fence post near the bottom and put in a hardwood peg, leaving a few inches projecting on both sides, to prevent heaving.

TO CORRESPONDENTS generally, and A. K. McD., particularly:—This column is intended to be used for the answering of questions pertaining directly or indirectly to farming in some of its branches. We take pleasure in giving to our subscribers all the information in our power; and such information as we have not at hand we will endeavour to obtain for them. All that we require is that the enquirer be a subscriber, or resident in a house where the FARMER is taken, and that the question possess some interest to the general reader as well as to the enquirer. The question asked by A. K. McD. is one fitted only to the columns of a sporting paper, being in no way connected with agriculture and not possessing interest except to a person devoted to horse-racing.

Miscellaneous.

Fish-Culture and Fish-Protection.

Mr. Samuel Wilmot, of Newcastle, Ont., sends us a paper which he read at the late convention of the American Fish-culturists' Association. In the last number of the CANADA FARMER we gave a brief synopsis of the paper; we now make more copious extracts from it. Fish breeding and the protection of fish during their spawning season are subjects of which the importance is only beginning to be understood, and they are subjects of prime interest to Canadian farmers, many of whom are so situated that they could derive a handsome revenue from the breeding of trout for the city markets. The Dominion is, to claim the least, abreast of the other nations in the science, and to Mr. Wilmot, as much as to any one, is the fact owing. In the paper mentioned, he says:

Fish culture having now become both a popular and successful industry in the United States and Canada, it is of importance that it should be vigorously carried on. The once many famous rivers in both of these countries have now become very much reduced in their supplies of salmon and other fish. This falling off is also experienced in the countless lakes and their innumerable tributaries everywhere throughout the land. Both demand early attention in order to prevent the final extermination of an article of food which it is now almost impossible to sustain in the natural way alone. A judicious application of the natural and artificial methods of propagation, together with thorough protection during the close seasons, would soon reproduce in those waters a large supply of fish, both for domestic purposes and foreign trade. The outlay required to achieve this object will be found to be trifling indeed in comparison to the ultimate benefits that would assuredly flow from its application.

There is a period when fish are in season, and when they should be taken by legitimate means. There is another period when they are out of season, and then should be protected by all legitimate means. They are in season after they have fully recovered from the prostrating and exhaustive effects of spawning, and when found upon their feeding grounds, putting fat upon the body. At this time, though the eggs and milt are in the ovaries, they are so minute as to take little, if any, nourishment from the system, all of the food taken forming fat and muscle. They are out of season when they have left their feeding grounds, and have reached their spawning beds, and are in the act of spawning. The eggs and the milt at this period having absorbed from the body of the fish most of the fat which had been previously put on, become enlarged to the full size, and are mature and ripe for being deposited.

In the egg will be noticed a fatty substance, resembling small globules of oil, which is provided by nature for the nourishment and growth of the embryo fish during incubation, and is the food contained in the sac attached to the young fry for several days after emerging from the shell. This drain of fat from the parent fish into the egg and milt, and the prostrating effects of spawning, cause it to become lean and lank in condition, and therefore foul, out of season, and actually unfit for food. The killing and eating of fish at this particular period should be strictly prohibited by law. It is not less repugnant to common sense than it would be to kill our domestic animals in an advanced state of pregnancy, or for some time afterwards. Why, then, should I people conjure up the belief that fish do not come under the same laws of nature as other animals?

It is also of importance to remember that nearly all fish, during the spawning season, become very dull, and are in semi-lethargic state, and, generally speaking, consume little or no food whilst performing this work of nature. Salmon eat nothing whatever at this time, neither do they take food within their stomachs from the time of leaving salt water till after they have performed the work of spawning, even should the time of their migration extend over a period of six months, or longer. At the end of their long journey, and from eating nothing since leaving the sea, they become changed in color, their former rich red flesh now becomes a flabby white, their bodies are frequently covered with wounds and sores, parasites begin to prey upon them, a fungoid growth sets in, and great numbers die. It is easy for any person possessing ordinary intelligence, and not selfishly prejudiced to the contrary, to infer how necessary and important it is that all fish should be protected by proper legislation at proper seasons, and also that all persons should be legally prohibited from killing or selling that which is foul and unfit for food.

Having explained the great necessity for passing laws in relation to the preservation of fish at certain seasons of the year, it will be necessary now to meet the question, Why resort to artificial means for the propagation of fish; why not allow them to produce their young in the usual way?

In contrasting the artificial with the natural method, the superiority of the former over the latter system will be easily understood, even by the great mass of the people, who are as yet wholly uninformed as to the novel science

of artificial fish culture, not long since introduced into the country.

It has been advanced by naturalists of an early period, and upheld by eminent writers of more modern times, that not more than one per cent. of the ova laid in the natural way ever becomes a living fish. But in the present day it is possible, by artificial propagation, to rear from eighty to ninety living fish from every hundred eggs, which larger increase is actually needed for restocking the waters of the country with fish of such various kinds as may be required in various places, and for supplying in part the increasing demand in the markets of the country for fish food.

As we have chosen to illustrate the necessity for legal enactments for the protection of fish, by introducing the salmon, we shall continue to take the same fish for an example while we explain the *modus operandi* of laying down and hatching out of the fish spawn in the natural way, and relate the many difficulties which beset the eggs at the time of their deposit by the parent fish, and through the process of incubation, and until they are hatched out in the river or other waters. It may be observed that these operations are performed at different times and places by the various kinds of fish.

Salmon, after leaving their feeding grounds, will, after the somewhat lengthened migration previously mentioned, reach their spawning grounds far up the river, or, in some instances, if very late in the season, near at hand above tide-way. A suitable gravelly bottom and rapid part of the stream is selected, where the female fish commences by writhing movements of her body to displace the stones and gravel in order to form the bed in which she may lay her eggs.

In this work she is very much aided by the swift current of the water, which helps to move the gravel down stream that is being displaced by the exertions of the fish. In this way a hollow spot is dug out, and a small hillock of stones is formed just below. Into this scooped-out bed the fish, by contortions and strong muscular action of the body, ejects a portion of the mature ova, many of which sink to the bottom amongst the gravel, whilst numbers are carried below and far beyond the bed by the current. The little ledge of gravel just above the bed is again disturbed, and the stones in the act of falling are by the action of the fish, assisted by the swift water, carried down over the eggs, thus partially covering them, and hiding many of them from sight, and also from many of their numerous enemies.

This operation of spawning will take from two to three days to a week, and sometimes longer, depending much upon the lateness of the season, and also the flow of water in the stream at the time. Should the season be dry, and the water low, the fish will rest in deep pools below, waiting for the water to rise in the rapids, that they may be enabled to get upon the shallows to form their beds.

All this time the eggs are maturing, and at last, late in the season, unable to retain the ova any longer, they will rush up at the first freshet, and in some instances lay the whole of their eggs in one or two nights.

During the time in which the female is engaged in depositing her eggs, she will generally be accompanied by a male fish, who performs very little, if any, of the labor in forming a bed; he is constantly hovering about just below the female, and when she is in the act of laying her eggs he will run alongside, and, by a muscular movement of his body, eject some of his milt, which, if perchance it touches the egg, impregnates it.

[We will resume our extracts from Mr. Wilmot's paper in our next issue.]

Peas Three Thousand Years Old.

In the course of late explorations in the ancient ruins of Egypt, General Anderson, an English traveller, found enclosed in a sarcophagus beside a mummy, a few dry peas, which he preserved carefully, and, on his return to Great Britain, planted in the rich soil of the Island of Guernsey. The seeds germinated, and soon two little plants appeared, from which, at maturity, sufficient peas were gathered to plant quite a large tract of ground in the following season.

Some of the plants thus raised have attained a height of over six feet, and have been loaded with blossoms of exquisite odor, and of a delicate rose tint. The peculiar feature of the growth is the stem, which is small near the root, but increases in size as it ascends, requiring a support to sustain it upright. The pods instead of being distributed around all portions of the stem, as in the ordinary plant, are grouped about the upper extremity.

The vegetable, it is said, belongs to the ordinary garden variety; but from its presenting the very distinctive differences above noted, it seems worthy of close botanical examination. The peas are of remarkably fine flavor, excelling in delicacy those of the choicest known varieties.—*Scientific American.*

ABSORPTION OF WATER BY LEAVES OF PLANTS.—It has recently been shown by M. Baillon that the leaves of plants are capable of absorbing water. He has been experimenting by sowing peas in a box of such a construction that the plants can be immersed in water without the roots or the soil in which they are growing becoming damp. He has kept peas alive for two months without giving the roots any water whatever, the soil being virtually quite dry.

How a Toad Undresses.

There are many animals which only undress once a year, and that is to put on a new suit; among these is the toad. An eye witness to the process thus describes a toad taking off his clothes:

About the middle of July, I found a toad on a hill of melons, and, not wanting him to leave, hoed around him. He appeared sluggish and not inclined to move. Presently I observed him pressing his elbows against his sides, rubbing downward. He appeared so singular that I watched to see what he was up to. After a few smart rubs, his skin began to burst open straight along his back. Now, said I, old fellow, you have done it; but he appeared to be unconcerned, and kept on rubbing until he had worked down all his skin into folds on his sides and hips; then, grasping one hind leg with his hands, he hauled off one leg of his pants the same as anybody would, then stripped the other leg in the same way. He then took his cast-off cuticle forward, between his fore legs into his mouth, and swallowed it; then, by raising and lowering his head, swallowing as his head came down, he stripped off the skin underneath until it came to his forelegs, and then grasping one of these with the opposite hand, by considerable pulling stripped off the skin. Changing hands, he stripped the other, and by a slight motion of the head, he drew it from the throat and swallowed the whole. The operation seemed to be an agreeable one, and occupied but a short time.

RANCID BUTTER, pork, and lard casks may be purified by burning straw or shavings in them.

IN TAKING UP BELTS, the time used in carefully cutting the belt square is always time saved.

IN PARIS the right to gather the fallen leaves on the public streets and avenues has been sold to the highest bidder for a considerable sum.

A WESTERN EDITOR, in speaking of a recent political victory, says that even the sheep celebrated the glorious event with an unusual display of bunting.

BELTS AND PULLEYS.—Adding to the width of a belt and of the faces of the pulleys increases immensely the power of conveying force. A wide belt is always better than a narrow one strained to its utmost capacity.

GAS FROM WOOD.—In Michigan, it is said, gas of 16 candle illuminating power is being obtained in the manufacture of charcoal, one cord of wood making 3500 cubic feet of good gas, at a cost of only 18 cents per thousand feet.

HOLLAND HAS 12,000 windmills in operation, each doing a six or ten-horse power service through the twenty four hours. They are kept up at an annual cost of \$1,000,000 and perform all the service required of steam engines at one-twentieth the cost.

WOODCHUCK TANNING.—The best way to tan woodchuck skins with the hair on is to sprinkle salt and alum on the hides, roll them up and let them lie until the salt is melted. To tan without the hair on, put the hide into a bucket of ashes and water, let it lie until the hair comes off freely, then take the hair off, then put it (the skin) into soft soap, let it lie there until the lye eats the flesh off, then take it out and rub it dry over a smoke.

THE BRIGHT SPOTS of a man's life are few enough with out blotting any out; and since for a moment of mirth we have an hour of sadness, it were a sorry policy to diminish the few rays that illumine our checkered existence. Life is an April day—sunshine and showers. The heart, like the earth, would cease to yield good fruit were it not watered by the tears of sensibility, and the fruit would be worthless but for the sunshine of smiles.

THE ATMOSPHERE OF VENUS.—The atmosphere of the planet Venus was distinctly visible during the recent transit, and was seen by the astronomical party stationed near Thebes, in Egypt, as a pale white circle around a part of the planet's edge, totally different from the brilliant sun light. "The general remark," says one of the observers, "was that it reminded us of moonlight." It is the opinion of many astronomers that the atmosphere surrounding Venus is much deeper than the atmosphere of the earth.

DRYERS FOR PAINT.—A correspondent of the English Mechanic says:—"As an old, experienced hand, there is no better I can give you than these few hints. All dryers have a tendency to destroy the virtue of lead. If dryers must be resorted to, litharge and white copperas are the best. Dryers often sold as patent dryers are no other than lime and white copperas. Terebinthac and other dryers, as sold, are often injurious. It is well to let colors dry slowly."

THE SIX FOLLIES OF SCIENCE.—The six follies of science are said to be the following:—The quadrature of the circle; the establishment of perpetual motion; the philosopher's stone; the transmutation of metals; divination, or the discovery of secrets by magic; and lastly, judicial astrology. It is unwise to say that anything is impossible, until the impossibility is demonstrated. It is not at all improbable that the present century may see that one of these so-called follies is a reality.—Journal of Applied Science

PORTLAND CEMENT.—Portland cement, says Mr. H. Faiza, of London, consists of carbonate of lime mixed with silica, iron and alumina, and is made by mixing chalk with mud obtained from the banks of the Thames and Medway, in the proportion of about four of chalk to one of mud; in some cases gault clay is used instead of mud. The materials are mixed in wash mills, and the result, called slurry, is run into large reservoirs or backs and allowed to settle. It is then dried and calcined at a high temperature, and afterwards ground between millstones to the requisite fineness.

FEMALE RIGHTS.—Only the female spiders spin webs. They own all the real estate, and the males have to live a vagabond life under stones and in other obscure hiding places. If they come about the house so often as to bore the ruling sex, they are mercilessly killed and eaten. The spider's skin is as unyielding as the shells of lobsters and crabs, and is shed from time to time in the same way, to accommodate the animal's growth. If you poke over the rubbish in a female spider's back yard, among her cast-off corsets you will find the jackets of the males who have paid for their society with their lives—trophies of her barbarism as truly as scalps show the savage nature of the red man.

ESQUIMAUX METHOD OF TANNING.—The Esquimaux's mode of tanning is very simple, and the material employed the cheapest and most accessible of any used in the art, viz., the urine of man and beast. The skins are prepared in the fur, and softened and tanned in urine, which is usually kept in tubs in the porches of their huts, for use in dressing deer, seal and other skins. They show great skill in the preparation of whale, seal and deerskins, and these, on the whole, are equal to the best oilskins made in England. It imparts to them firmness, durability, and makes them waterproof. The boots worn by the Esquimaux are generally made from seal or walrus hides, and resist the encroachments of water.

UTILIZATION OF SAWDUST.—Some exquisite specimens of work, vying with the finest carvings, have been turned out by the cabinet-makers of the Faubourg St. Antoine, Paris. It appears that by the simultaneous application of great pressure and heat, these ingenious workmen have succeeded in causing the particles of sawdust to agglutinate, so that, if compressed in a mould, the result is a solid mass, of any desired shape, presenting a brilliant surface, and endowed with a durability and beauty of appearance not found in ebony, rosewood or mahogany. This product is known as bois dure. Another very peculiar body, which approximates more to boxwood in appearance, is formed by the admixture of glue, phosphate of lime, alum and sawdust, a kind of dough being formed with boiling water, which admits of being pressed into moulds. This compound also takes a very high polish.

THE USES OF BORAGE.—This plant, the Borago officinalis of botanists, is of sufficient use to render it worthy of more cultivation among us. A writer in the English Mechanic enumerates some uses for this plant not commonly known. The large leaves and tender stalks, dipped in butter and fried, make an excellent and savoury dish. The brilliant blue flowers are very pretty as a garnish for salads along with Balsam flowers. The young leaves boiled are a good substitute for Spinach; or, if dressed with hot butter and grated cheese, an excellent and new vegetable. The plant contains a certain amount of saltpetre, as may be proved by burning a dried leaf. For this reason it is used with great benefit for the relief of sore throats. The root is rich in gum, and if boiled, yields a mucilaginous emulsion, excellent for irritations of the throat and chest. Very violent attacks of toothache, where the nerve has taken cold, are often cured by holding a portion of the leaves, previously boiled in milk, and applied warm, in the mouth, against the affected tooth. Lastly, bees are extremely fond of Borage, and it appears to repay them well for their attention.

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