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THE CANADA FARMER.

VOL. XIII.—No. 10.
PUBLISHED MONTHLY.

TORONTO, CANADA, OCTOBER 15, 1876.

\$1.00 Per Annum.
(SINGLE COPIES TEN CENTS.)

Agriculture.

Lime in Agriculture.

The agricultural action of lime is both chemical and mechanical, and its application, in proper quantities, to almost every kind of soil, is followed by beneficial results. It acts in several ways, but chiefly by dissolving excessive accumulations of vegetable matter that has become inert, thus rendering it soluble and fit for plant food; and by acting upon and facilitating the appropriation of mineral matter for the same purpose. Although lime is present in most soils, it is usually so in small quantities—much too small to supply the crop demands, or, should the natural quantity be sufficient in some cases to aid vegetation, since all plants require lime, it follows that, with successive cropping, the supply must soon be exhausted, and the land, as a consequence, be impoverished. Boggy or peaty soils have their fertility often hindered by what is known to chemists as sour humus, that is an accumulation of undecomposed vegetable matter which is likewise present in a greater or less degree in all long-cultivated lands, and which is supposed to exercise an injurious effect on plant-growth. When existing only in moderate quantities, this humus is beneficial, but when, as in boggy soils, it is present to a hurtful degree, the remedy is a plentiful application of lime. In the action that follows such application, not only is the injurious humus dissolved and rendered available as plant food, but during the process of decomposition, three other most important ingredients are formed, carbonic acid, nitric acid and ammonia, the first-named constituting one of the chief supports of vegetable life, while the other two are of equal importance to the soil, the one combining with what humus still remains undecomposed, the other uniting with bases to form nitrates. In cold, stiff, clayey soils, again the action of lime is very similar and equally beneficial, its functions being now, however, exercised chiefly on mineral instead of vegetable constituents. In clay we find several alkalies, especially potash which, in combination with alumina and silicic acid, exists in a condition in which it cannot be dissolved and conveyed to the roots of plants by the solvent power of rain. The action of lime here is to dissolve this substance and combine with the alumina and silicic acid, setting the alkalies free, and these latter, being readily soluble in water, are thus distributed throughout the soil and rendered available as food for plants. Mechanically, lime acts upon boggy and clayey soils by transforming them into a more finally decided condition. The former it fits for a more uniform incorporation of fertilisers; the latter it renders less tenacious, more open and porous, and thus prevents its consolidation into a mass of matter impenetrable by the roots of growing vegetables, air, heat, &c. Summarizing the whole, we may classify the agricultural effects of lime as four-fold: it is a necessary ingredient of plant food, and must be supplied as such; it disposes inert vegetable matter to become food for the plant; it dissolves mineral matters in a similar manner and renders it available for a similar purpose; and finally, its effects are mechanical. Notwithstanding all its good properties, however, lime must not be used indiscriminately, but with the fullest regard to the condition and circumstances of the soil to which it is to be applied.

Run-Down Farms.

In several districts of Ontario, some of them what may be called the "more advanced" in other respects, it is a painful though none the less positive fact, that farming is neither what it was once, nor what it now ought to be. The returns are poorer, the cattle are scrubby, and nothing seems to prosper as it should. Discouragement is of course the result and listlessness seems fast following in its

wake. What is the reason? Simply that those affected have overtaxed their land without attempting to reinvigorate it. They have ploughed nearly all their clearings and raised crop after crop of grain until their soil has run out. The surface is exhausted so that seeds will no longer catch on it. Wheat has first been the order of the day until it failed; then oats until they followed suit. Hay never received much attention, and still less was given to roots. The system of manuring has been almost, if not quite, equal to no system at all, for the stock, or rather half stock, and scrubs at that, are fed mostly on dry straw during winter, and kept in a half-famishing condition all the year round.

We are induced to make these remarks from a letter that has just reached us wherein the writer bemoans the contrast between the present and ten or fifteen years ago, but says not one word about the returns he has made to

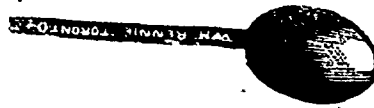


Draining Spade.

his land during the interval. While the virgin soil remains young and vigorous, no wonder it yields good crops; but it must not be forgotten that, with a series of successive crops, this vigour cannot last. What we would advise our correspondent and all others similarly situated to do is this:—Begin and sow about half your ploughed land with clover and grass seeds for hay and pasture. Summer fallow from five to ten acres each year, according as your farm exceeds or falls short of a hundred acres, and drain thoroughly: the cost will be returned in a couple of years. Sow about half as much wheat as you used to sow, and use the very best seed. Raise from three to six or eight acres of roots; attend to them well and they will not only enable you to double your stock, but largely increase your manure heap. And finally, keep the very best stock you can get—thorough-bred if possible—and see that the males used for the future are of the same class, otherwise your stock will go back.

Draining Implements.

By the use of certain implements specially made for a purpose, that purpose can be not only more easily but more economically effected than by using other tools not so made. This is true in the abstract and applicable generally, but in a peculiar manner to draining. Viewing it in its most favorable aspect, ditching is a heavy, disagreeable process, and anything tending to lighten or expedite that process will be hailed with satisfaction,



Post-Hole Spade.

Few people care about employing a regular ditching machine unless their work is likely to be quite extensive, still fewer will purchase one, for the simple reason that, for these purposes alone, the investment would not pay. The ordinary spade and shovel are consequently resorted to, and, although they are on the whole quite sufficient to the task, is it not worthy of consideration that a great deal of hard digging, heavy lifting, and lost time could be saved by using some other more appropriate implements? The draining spade, here illustrated is now used by all experienced ditchers. The blade is from eighteen inches to two feet long, tapering from six to eight inches wide at the top to four at the end, and convex, the concave surface uppermost. It is made of the best steel, and very strongly strapped to the handle. By means of it a good ditcher will dig half as much again per day as he would with the ordinary spade, and be less fatigued at the close.

The next implement, called a "crumber," is most useful and convenient. It is designed to clean out, or give the "finishing touch" to the bottom of the drain ere the tile is laid. In ordinary soil, the one here illustrated answers the purpose admirably. Of course its appearance will suggest the mode of working it. In the case of very wet land, however, and more particularly wet quicksands, the blade (which is also concave, like that of the spade, but the same width throughout, viz. about three inches) is reversed, and made to work towards you that is to say, with the first you move forward and finish ahead of you as you go, with the second you move backwards, finishing towards you, and thus obviating the necessity of stepping on the finished portions. There are thus three different implements of moderate cost which farmers would find highly serviceable on the farm for ditching purposes—the spade and the ordinary and reversed crumber. Another very useful article is the post-hole spade, which we also illustrate, for lifting out the soil after it has been loosened by a crowbar. It is also made of steel, in the form of a spoon, curved out at the bottom edge, and supported by a wrought iron strap, making it very strong and durable. Our cuts are taken from Mr. Rennie's catalogue

The Indigenous Forest Trees and Shrubs of Ontario.—No. 3.

Asimina triloba, COMMON PAPAWE.—A small tree, bearing a large, sweet, edible fruit. Common in "Middle States," extending far South; in Canada found sparingly in the Niagara peninsula only.

Menispermum Canadense, CANADA MOONSEED.—A handsome climber, sometimes reaching a height of fifteen feet. The berries—which are about the size of black currants—contain crescent-shaped nutlets, whence the common name. *Menispermum* is stimulant, diaphoretic and tonic, and has been used in place of sarsaparilla. Common in Northern States and throughout Ontario, from Quebec to Winnipeg.

Hudsonia tomentosa, DOWNY HUDSONIA.—A small shrub, hoary with whitish down. Not common in Ontario; found on the shore and islands of Lake Superior. Ranges from Maryland to Minnesota and Slave Lake.

Hypericum Kalmianum, KALM'S ST. JOHNSWORT.—A small shrub, having four angled branches, flowers yellow, large and clustered. Not common in Ontario; ranges from Niagara Falls to islands of Lake Superior.

Tilia Americana—BASSWOOD.—A large, beautiful, and very useful tree, common all over Ontario. It does well as an ornamental shade tree; is hardy, grows rapidly, and the deliciously scented flowers afford a rich harvest to the bee-keeper. Basswood lumber is extensively used in carriage building, cabinet making, and sometimes in house finishing; it, however, does not last long "between wind and water," and should always be protected by paint. In new settlements, basswood is generally split into fence rails, although they are not durable; it is, perhaps, a little inferior to pine as fuel. It is sometimes used as lower pump logs, in paper making, and the "second growth" wood makes the best ox yokes. Basswood bark is used as a roofing material, and the "inner bark" as cordage by the settler and by the Indians. A decoction of the inner bark is an excellent tonic; the buds bruised, make a poultice which may be used with good effect as a substitute for bread poultice; the buds are eaten greedily by cattle old and young. "Hollow" basswood trees are often met with; they, of course, are useless to the lumberman, but hollow basswood is not without value to the settler, even as an aid to poetic and moral reflection—as

"I stood by a hollow basswood tree,
The wind it hollow blew,
I thought upon the hollow world
And all its hollow crew."

The standing hollow trees were used by the Indians as

places of sepulture for their dead babies; a hole was cut with a tomahawk into the hollow, the body was then pushed in, and the hole filled with sticks, which was the only monument their art could supply. By the settler the hollow trunks are often sawed into lengths of from two to four feet, which are then like barrels without heads, and are used as "ash leaches," dog kennels, hen and goose nests, and many other of the requirements of a backwoods farm. In the forest, the hollow basswood affords shelter to wild animals, such as the bear, lynx, racoon, fisher, porcupine, and squirrel. Basswood ranges from the Middle States to north of the Saskatchewan plains.

Xanthoxylum Americanum, PRICKLY ASH.—A prickly shrub, from two to six feet high, of upright, dense and graceful habit. The flowers, which are yellowish green, appear with the leaves in spring. This is one of our native shrubs, which might do well as a hedge; it grows very dense, the stems are rigid and tough; it holds the ground well, is not eaten by insects nor domestic animals, stands cutting well, and the extreme sprays are not injured by the hardest frost. A spirituous infusion of the bark of prickly ash has been used as a stimulant, as also the fresh juice of the root: a decoction of the bark makes an excellent wash for foul ulcers. Common in Southern and Middle Ontario.

(To be continued.)

Cross-Drilling Grain.

A Farmer in the neighboring town of Henrietta is making an involuntary but none the less interesting experiment this season. In drilling his barley the first week in May, by mistake the orifices through which the grain was distributed were made the same as for drilling wheat, thus sowing only a trifle more than a bushel per acre instead of 2 or 2½ bushels. Several rounds were drilled before the mistake was noticed, and instead of going back and re-sowing the thin portion, the field was drilled at the rate of one bushel per acre, and then cross-drilled with the same amount of seed. The result is a great success. A little superphosphate was drilled in the first day, and a heavy rain coming a few days after, the barley was soon up and growing vigorously. Now, June 21st, it is heading, and a better stand of barley I never saw. The ground is entirely filled, and yet every plant seems to have plenty of room. The barley is of the 6-rowed variety, and many of the heads are set for seventy to ninety grains. The only danger is that the rank growth may cause the straw to fall and not fill well. Barring this, the chance is good for the largest yield of barley on record. Where two or two and a half bushels of seed are drilled in one drill mark, the plants crowd each other so as to stunt their growth. This may be an advantage on very rich land, though of that I am doubtful, but for poor soil cross-drilling with one-half the usual amount of seed each way must be much preferable. Even on rich land I should be inclined to try cross-drilling, but using ashes or German potash salts to stiffen the straw. On very poor land some well tested commercial manure should be used each way, giving the crop a double dressing. With 150 lbs. of superphosphate each way, at \$45 per ton, the cost of manuring a crop would still be less than \$7 per acre. Of course where spring grains are cross drilled, it is not worth while to sow grass seed. Everything except the most rampant weeds will be smothered by the luxuriant growth of grain.

Mr Geo B Terry of Henrietta has for years practised cross-drilling his wheat and he has never failed of securing a good crop. He sows one bushel per acre each way. Some other good farmers drag their wheat fields across the drills, and this displaces some of the grains and leaves them farther apart. They first tried dragging their drilled wheat from having the stubble catch in the drill tube and leave the grain uncovered. To their surprise this dragged wheat stood the winter better and gave a better yield than that on land in better tilth. They now cross-drag wheat even on summer fallows, but I think cross-drilling is every way preferable, as it leaves the seed more evenly distributed.

It is a mistake to suppose that winter grain is always better to be left in the furrow of a drill tube. In cold, dry winters this ridge of earth on either side is a protection: but on heavy soils in a wet winter, like the last winter was, water remains in the drill furrows, and freezing and thawing speedily kill the plant. In such winters it is better to have the wheat on the ridges, instead of in the hollows. By dividing the seed and drilling both ways the wheat is prepared for either contingency. Half is in

the furrows and half on the ridge. If the soil is rich and two bushels are sown per acre, either half the seed is enough for a good crop. By cross-drilling winter grain, especially if manure is used, the plants get a much stronger root, and are prepared to stand the winter. Good farmers are growing more and more careful to get their crops in the ground in the best way, and either for spring or winter grain, I think the extra labor in cross-drilling the seed will be as well paid as any labor given in cultivating the crop. In the barley field first mentioned, I have little doubt that on six acres there will be at least fifty bushels more barley than there would have been if all the seed had been sown one way. This is pretty good pay for the labor of man and team with drill, for something less than a day.—*Cor. Country Gentleman.*

Digging Ditches Economically.

A ditch is an open channel for conducting water, while a drain consists of a subterraneous passage for water. When ditches are excavated with hand tools only, the work is laborious and the cost more expensive than when teams and machinery can be employed to perform a part of the work. Many years ago, when we were in the possession of a farm, much of which required draining, we performed a large portion of this irksome drudgery by the aid of the team and the common plough. Setting stakes for the line of the drain, the plough was run along this line, turning a furrow, which was then thrown back out of the way by hand with shovels. The plough was then put through back again down the drain, the near horse walking in the furrow; this loosened dirt was also thrown back. We found, however, that this opened the ditch rather too narrow, and in cutting one since, proceeding in the same way, allowed the off horse to walk back in the cleared furrow, which, if the plough is set for a narrow furrow in common ploughing, will cut about the right width. The ploughing and clearing was continued (the near horse in the furrow) through three times more, when we found we could go no deeper because the double whiffletree dragged on the ground.

The clovis was then raised above the top of the beam and one horse put on, which by walking in the ditch drew the plough up and down once more, thus loosening the hard soil about one foot in depth. This work was done in less than half a day, and saved at least two-thirds the labor had it been dug by hand. Our ground is full of small stone, making the use of a pick requisite, and increasing the work of ditching to some extent above that of a simply clayey soil. After this experiment a long double whiffletree was employed (say six feet in length), with a horse at each end. Then the subsoil plough was drawn by a chain three or four feet long, extending from the whiffletree to the plough. With a subsoil plough the earth could be broken up to the depth of three feet. When laying small drain tile in a ditch, it is a nice job to get a level surface among the stone and over the occasional soft spots of sandy clay found along the bottom. When laying tile of any size we first place them within reach along the bank, and then, facing the head of the drain, stand upon each one, and with one foot stamp it down until it will not rock or tap either way. On ground free from stones the work is simple and easy, but here we often come to a spot where a stone of some size had to be removed to get a level bottom. Here the tile will not lie firm without the hole is filled up with small stone and a flat one placed under the end of this tile, and the next one just low enough to keep the watercourse level. When the tile lies firm under our feet, as we stand upon it, we proceed to the next, and not before. In the sandy bottom soft spots larger flat stones are filled in to keep the course of tile to its proper place, so that they may not sink into the mud and thus become obstructed. When these soft sandy places are over two feet in length we lay in a good sound board to keep the tiles in the proper place.

As a covering for tile before putting on the dirt we have used straw, small stone and pieces of sod; but it is only the larger cracks which need anything, and sods are generally most easily got, and, we think, will answer every purpose. After shovelling in a few inches of dirt, and treading it down, the remainder may be filled in by a plough, with a long whiffletree, to allow one horse to walk each side of the drain. Or some use one horse to a plough and require the animal to travel over the tile. But this is a practice not to be commended, as there are numerous liabilities to displacement of the tile and crushing tender ones. The first dirt should be shovelled in the ditch by a man who will be exceedingly careful to avoid breaking tile by allowing stones to fall on them. If hard tile are properly laid, the drain will remain serviceable for ages to come.—*N. Y. Herald.*

Clawson Wheat.

The Clawson Wheat has become very popular, says a writer to the Boston Cultivator, as it has proved to be a very large yielder, and standing the winter better than any other variety. I had 44 bushels against 25 of the Dye and 26 of the Red Chaff White Wheat, with the same chance. One of my neighbours had 52 bushels per acre. Allen, one of our large farmers, had 40 acres which averaged him 40 bushels per acre, and he considers it the most profitable wheat to grow, as it is very hardy and a large yielder. There is a large demand for it wherever it is known. The Hon. Geo. Geddes, of Syracuse, N. Y., writes of the Clawson Wheat to the N. Y. Tribune as follows: "One of my friends harvested 35 bushels of this wheat to the acre, and that, too, in the same field and under the same conditions that gave of the Diehl and of the Treadwell only 20 bushels to the acre. Another of my neighbours had a little over 30 bushels, against less than 20 of the Mediterranean. These are men who are willing to make exact experiments, and test a new thing beside an old one, and learn whether the new is any better than the old, and they have sold their entire crops. I know of one man who, two years ago, procured one bushel of this variety of wheat at a great cost, as seed, some of his friends thought, but this single bushel of wheat has produced in increased yield and in increased price, more than \$200 profit."

Improvement of Grass Lands.

This has been a great season for grass, and the coming autumn will be most favorable for sowing the seeds, especially where it is needed, in the bare and thin spots in our meadows and pastures. If the grass sown with the wheat or oats is not thick enough, we may now sow the seeds upon the stubble, and follow with a heavy roller or light harrow. If this is attended to at once, the moisture in the ground will secure for us a good "catch." If a little well-rotted farm-yard manure is spread upon these thin places before the seeds are sown, we shall find it the most profitable use we can possibly make of such manure; and if the ground is thin, such an application is really essential, as, without it, we shall find it almost impossible to produce a good sod. Farmers who cut the second crop of clover for seed, will find that the most profitable use they can make of their clover straw and chaff will be to spread them upon these thin places in pastures and meadows, or upon their fall wheat, where they have sown grass seeds. This application may be made at any time after the clover is threshed; and it will be found as beneficial to the wheat as in thickening up the grass.

We have frequently urged the great importance of good pastures and meadows—that while, in case of a good thick stand of grass and clover, we have the most satisfactory profits that can be derived from the soil, thin pastures and light meadows are most especially unprofitable, because we are bound to have with them thin cattle, thin sheep, thin horses, and, ultimately, thin lands. We, therefore, again urge upon our readers not to neglect the present most favorable opportunity to get their grass lands in order—in the highest and best productive condition. Don't be afraid of wasting the seeds—sow enough—sow in every spot where grass is needed, and where the "stand" is not satisfactory, and you shall have your reward. On the young grass and clover, in wheat or oats stubble, 100 lbs. of plaster, (gypsum) to the acre may be sown, with great advantage and profit, where a stronger growth is desirable. This is the cheapest fertilizer that can be used, and its application should not be neglected where the land is thin, and the grass requires stimulating food.—*National Live Stock Journal.*

Sowing Clover on Grass.

Wishing to fertilize the undersoil of a piece of sod without breaking it up, I tried the experiment of sowing clover on it. The sod was a good one, covered with a good coat of aftermath in the fall. I gave it a thick seeding, and rolled it down well, as early as the ground would permit. The clover soon came up and began to grow; but the grass threatened to smother it. I now passed the mower over it, cutting it close to give the clover a chance; and to aid it farther, I sowed plaster. I feared that the vigorous grass (timothy and other native grasses, the sod being an old one) would be too much for the young clover. But it grew and thickened, and under the influence of the plaster got the advantage of the grass, except on one place where the grass was unusually thick and vigorous. After the plot, twenty-four by thirty feet, had obtained a few weeks' growth, it was mowed again, the clover decidedly predominating, except on the part mentioned. Here it seemed the clover would have to succumb, but it still retained life, and made some advance, which was increased decidedly at the third cutting, the rest of the piece fur-

mishing as fine a stand of clover as any one could desire. I have (the third of August) just given it the fourth cutting. It was a mass of clover, as thick as it could stand, about eight inches in length. The whole plot is now covered with clover, though less dense where the grass was thickest. Very little grass is now seen; and it may disappear entirely at the next cutting. On a strip at the upper end—the plot is on a prettily steep hill facing the north—the roller was not used (or a test). Here there is some grass, and the clover is not so stout, a pretty clear case of the necessity of rolling the land well, under such circumstances.

It will of course be seen that frequent mowing favored the clover. Without mowing there would doubtless have been a failure. The encouraging point is that one cutting, or certainly two, will insure success, unless the sod is unusually heavy. But ordinary soil, say the average, which comprises most of our grass land will admit of it. Some may object to the necessity of passing the mower over it, fearing that it will lessen the yield and add to the expense of labor. But the cutting, it must be observed, will be an early one. And the object is less the grass than the clover. As the grass is yet short there can be but little loss; but really there is no loss, as it remains on the ground and is appropriated by it, aiding the growth of the clover that is to follow.

The case is the same should a second cutting be deemed necessary, which can be ascertained by the growth of the clover, which, if it is strong enough to sustain itself, needs no farther attention. But the second cutting, should that be deemed necessary, will take place early enough—about the middle or 20th of June—to still grow a crop of clover, of the medium variety, with sufficient time for the necessary amount of aftermath for winter protection. Perhaps the greatest advantage of the plan will be with a clover lot run out. In this case there need be no mowing, only the sowing of the seed, the land being bare and mellow. Giving a previous harrowing may be an advantage, followed after the seed by the roller. Let the roller be a heavy one, or, if less heavy, pass over twice, cross-rolling the second time. The two points that control in this mode of treatment are the plaster, which has little effect upon the grass, but a great influence upon the clover, and, as I have said, the mowing thus favoring the clover, and at a time when the plaster comes to its aid. Where the land is quite poor and the grass light, manure should be added, and the harrow passed over before the seed is put out. In no case sow less than a peck of seed per acre; a few quarts more, as a rule, will be safer. I shall give the plot one more cutting in a few weeks' time, and then let it stand for winter. I expect to have a yield of pure clover next season. In the spring following I shall sow down to grass early without manure, deeming that the land will be rich enough, and also sufficiently mellow to do without harrowing. The plot was a piece of barren land, growing nothing, and was soded a year ago. The sod was light and taken from poor soil, and had to be fed during the summer to establish it, the strength given it being pretty nearly all exhausted by the time the fall aftermath was grown, so that the growth, except on the one place mentioned, was not very strong.—*Cor. Country Gentleman.*

Sowing Winter Wheat.

The *New York Herald* says:—This may seem to be premature and injudicious advice to publish for the benefit of those farmers who are accustomed to raise a crop of winter wheat every season. But as the growing wheat is so frequently damaged during the severely cold storms and cold periods, and during the prevalence of cold winds, our judgment is that it will be more satisfactory in every respect to prepare the ground thoroughly during the autumnal months, as if winter wheat were to be sowed, and continue to work the land until winter, and then put in the seed of spring wheat at the proper period the next spring. By adopting such a practice the propriety will avoid all the damage incident to the growing crop when the seed is sown in autumn. As varieties of spring wheat have been recently improved to such an extent that white spring wheat will command about as high a price in market as white winter wheat, those who own land suitable for raising this sort of grain need have no hesitancy in discontinuing the cultivation of winter wheat and raising spring grain only. This practice will enable tillers of the soil to prepare their ground more thoroughly for the seed than it could be done if winter wheat were sown. Growing wheat needs manure. The soil must be rendered fat with fertilizing matter that will afford a generous supply of wheat-producing material to the growing crop. When this is not done it will be folly for a farmer to attempt to raise either winter or spring wheat. In some of the Western States, where the soil is naturally deep and sufficiently fertile to yield thirty or more bushels of excellent wheat per acre, a great many farmers have abandoned the cultivation of winter grain, and raise white spring wheat only. If farmers in New England and in some of the Middle States who have never raised spring wheat would give their wheat ground two more workings during Octo-

ber and November—that is, where the soil is dry and heavy—and would add a light dressing of muck, and collect sufficient barn-yard manure to spread over the surface lightly, they would meet with more satisfactory success in wheat culture than they have experienced at any previous period.

Wheat Growing.

Some weeks ago, says a writer to the *Lancaster Farmer*, I saw a statement that Mr. J. M. Heiges, of York county, had grown seventy-one bushels of wheat on an acre of ground. These reports were so extraordinary that I was rather skeptical as to their truthfulness. To satisfy my doubts I addressed a letter of inquiry to Mr. Heiges. He very kindly answered my letter at length, saying the reports, as stated, were perfectly true; that he actually raised at the rate of seventy-one bushels per acre. Also, that he grew fifty-five bushels per acre of the Foltz wheat in 1874; and, in 1875, another variety produced him 49½ bushels per acre; and this season his choice variety produced him only 51 bushels and 21 lbs. per acre. He gave a neighbor 2½ bushels last fall, and this neighbor now reports 102 bushels grown on 2½ acres! This neighbor is a member of the York County Agricultural Society, is 65 years of age, and says it is the best yield he ever had. Now, when one or two farmers can grow 60 to 71 bushels of wheat to the acre, why cannot other farmers do likewise? At this rate wheat-growing will pay as well, if not better, than growing tobacco. My impression is that Mr. Heiges' soil is not naturally very strong or rich.

But to give Mr. Heiges' mode of culture, and which I apprehend is the main cause of his success. He sows his wheat on oats and wheat stubbles, but manures heavy and ploughs deep, and ploughs the second time still deeper, pulverizes his soil thoroughly, and sows his wheat about the 25th of September, and has not had a failure since he commenced his present mode of culture. One of his reasons for adopting this plan was that he thought he were not raising half enough wheat per acre, and as he would not plant ten grains of corn in a hill, or plant a field of corn and not cultivate it, he asked himself why it would not pay to cultivate his wheat as well? He tried a sixth of an acre, and his yield was a little over eight bushels. He tried an acre next year, and fifty-five bushels was the result. He has taken four crops of wheat from one plot of ground in succession, and intends sowing the same field again this fall. Had as good wheat on this plot as he saw on any other ground.

As before stated, his plan is to manure heavy and plough deep, pulverize his soil thoroughly, and, about the 25th of Sept., he ploughs again a little deeper still, and prepares his fields into ridges and depressions—the depressions about 12 inches wide and the ridges about 10 inches—thus:

12 in. 10 12 in. 10 12 in. 10 12 in. 10 12 in.

sowing the wheat broadcast, and going over with the harrow in the way of ridges and depressions; then dragging, so as to make the field perfectly level; thus the seed nearly all fall into the 12-inch depression, or spaces of a regular depth. Then, in spring, so soon as the ground becomes moderately dry to work, he goes through with some kind of a cultivator two or three times, until the wheat becomes too high, thus giving regular cultivation, the same as a field of corn. This spring cultivation, no doubt, is the cause of his great success.

He has two varieties of wheat—"Champion Amber" and "Heiges' Prolific"—that are very stiff in the straw, stand up well, and are both bald wheats. Though Mr. Heiges considers both these varieties as very superior, yet he does not believe that by the ordinary culture they would produce such great crops as by his mode of culture.

Fall Ploughing and Drainage.

We are not addicted to writing homilies upon the manner in which the ordinary work of the farm should be performed. Every farmer knows, or should know, how to plough, sow, reap and harvest his crops. He also ought to have studied the nature of his soil and the proper means to render it most productive. If he has not, no agricultural writer can instruct him; since, to profitably instruct, himself must know the location, soil, subsoil and other conditions present, and which are often varying ones, even on the same farm.

A life-long experience in working the soil, however, has taught us that, upon our ordinary prairie soils, and especially upon those inclining to be tenacious in their character, the necessity of fall ploughing. It not only tends to destroy a vast amount of weeds through the germination of the seeds already ripened, but turning under the trash and stubble, assists to render the soil dryer through mechanical action, and adds to its fertility by the decay of the vegetable matter ploughed under. Then again, the opening of dead furrows between the lands assists greatly in allowing the superabundant waters of late autumn and spring to run quickly off, enhancing the earliness of the soil to be worked, sometimes a week or ten

days. If the land be left rough and open to the disintegrating action of the frosts and rains of winter, it then comes out in the spring in the most proper state to receive the seed; and the work carefully done, in nine cases out of ten all tenacious soils will produce better crops of small grain than if left to be ploughed in the spring. If necessary to be reploughed for later crops, this need only be a superficial one, so that instead of the farmer being driven by his work, he drives the work and often has his crops in a fair state of forwardness when his more dilatory neighbors are only thinking of getting ready to work.

The subject of drainage is also one too much neglected. A very little work in the fall, opening furrows and water ways, will result in drainage that will surprise those not accustomed to it. This should be continued as late in the fall as possible, and, in planting either late or early, no land should be left until the dead furrows and water ways have all properly been attended to, since, if left, these may afterwards be forgotten.

Portable Pig-Pen.

The writer has used the following plan for a cheap and portable pig-pen for store pigs, and finds it very convenient. It consists of two portions—the sleeping box and the yard, both portable but not fastened together. Two men can lift each part separately and carry it into fresh ground, when the yard needs cleaning out, and weeds, rubbish and potato tops can readily be thrown into the yard from a cart.

The yard is made of inch spruce fencing strips, four inches wide, 10 or 12 feet long, nailed to three by four inch spruce posts, placed at the corners and in middle of each side. As the posts do not enter the ground, two men can easily lift the yard and carry it to fresh ground. Five strips are used on each side, with three inch spaces between the strips. On one side of the yard, two of the strips reach only half way, leaving an opening from the yard to the sleeping box. A trough of 1½-inch spruce, six inches wide, nailed together at right angles, is used for feeding in the yard.

The sleeping box is of matched boards, four feet by six feet on the floor, 30 inches high in rear, and 42 inches high in front, which is partly open, and stands against the opening in the yard. The roof slopes from front to rear like a lean-to shed, and there are two handles at each end, by which two men can lift it for removal. This box stands on legs, which raise the floor eight inches above the ground, keeping it dry in wet weather. By littering it well the pigs will thrive in quite cold weather; but this arrangement is intended chiefly for summer use, when we generally carry a larger stock than can be accommodated in the more comfortable winter quarters. Eight or ten pigs just weaned are put in one yard, but as they grow larger, a smaller number only should be allowed. The yards will need removal and cleaning out once in two or three weeks. This plan could be used, perhaps, by those farmers who feed their pigs on growing clover, removing the pens daily, much on the same principle as the English farmers feed their turnips and other crops to sheep, in the so-called "hurdles." Yard and box together will need about 250 feet of spruce lumber, and can be made in half a day by an ordinary man who can handle tools.—*Country Gentleman.*

Another Method with Manure.

A writer to the *New England Farmer* says
A large class of farmers at the present time apply the manure in the spring, do a good share of their ploughing in the spring, when the team is the least able to endure hardship, and it is really harder ploughing at that season than any other. Now I have become satisfied beyond a doubt that the best time to plough and apply manure is in the summer, as soon as may be after haying, and as late as the middle of October. I commence to draw the manure as soon as the first of September, spreading it invariably from the cart, and all the better if harrowed in the same day, as I believe that manure loses its strength by evaporation. Land thus prepared will not only help facilitate the work in spring, but will give better crops than by any other way that I have tried. I have handled from 100 to 150 loads of manure the last of March and put it in large heaps to lay till the middle or the last of May, and have then applied it to the soil, and I had rather have two loads put on in the fall direct from my barn cellar than four loads in this way, as it leaches and dries up so that it becomes of much less value. I have for years applied my manure both ways, but should have adopted the new way years ago had my cellar been large enough to hold a year's stock of manure. In most cases, when I seed down to grass the first year, I get splendid crops of grass—the reason of it being that the land is not all worn out by cropping before I seed it down, and the manure gets incorporated in the soil and is ready to act at once. How many times I have seen little heaps of manure (about six to the load), lay over ploughed fields and on the grass land, to be spread the next spring. Where the heaps lay the soil is

too rich, and if sown to grain it all lodges, the straw is almost worthless, and the grain does not fill. If potatoes is the crop, one will have a good growth of vines and a legion of small potatoes. If grass land, the grass where the heaps lay is all killed out, and in return noxious weeds come in.

In building barns many make a mistake by not having more room in the manure collar. It should be at least nine feet high—ten is better—with trough shape at the bottom, and cemented so as to preclude the possibility of losing the best of the manure. The stable should be 16 feet wide, so as to drive in with muck or other absorbents, and there should be a space back of the trench, three feet wide (like a bin), and 3 or 3½ feet high, for storing absorbents. With such a stable, where the cows are kept in at night, the year round, and the manure applied in the fall, instead of having a farm running down, it would make one smile to see the increase in the crops. Who says my way is not a good one?

How to Use Muck.

The *Country Gentleman* says:—A correspondent informs us that he has a large muck bed on his place, from which he is now drawing out to dry ground, and he wishes to know the best way to apply and use it. In answer we may state that there are three distinct ways, namely: 1, drawing it out and spreading it at once on the land; 2, using it in forming compost heaps; and 3, applying it as bedding for animals in stables, or for spreading in cattle yards.

1. Swamp muck, as commonly seen in a moist state, is about seven-eighths water. In this condition it is of little value, unless applied directly to land, thoroughly harrowed into the soil to intermix the two completely, and then ploughed in. But there are very few cases where this will be of use. The muck must be black, and the vegetable matter well decomposed; if brown and fibrous, it will not answer; the more nearly it resembles the leaf mold of upland woods, the better it is for this purpose. The vegetable matter which constitutes swamp muck is more imperfectly decomposed and disintegrated under water than the leaf mold of upland woods, and at the same time it contains usually more or less of several vegetable acids, all of which temporarily diminish its value. In addition to the drawbacks, muck alone will be of little use if applied to soils already supplied with enough vegetable matter; it will only be carrying coals to Newcastle. Hence the reason that so little beneficial effect is so commonly produced where fresh muck is applied as a manure. In other instances, however, the fertility has been increased where it has been taken from swamps that have no outlet, into which fertilizing elements have been washed from soils, or where various animal matters have accumulated. If a running stream passes through the swamp, and if these valuable matters will have been carried off.

It will therefore be seen that the varying conditions, both of the soils and of the muck, may produce greatly varying results, and the only satisfactory means to determine whether applying muck directly to land will be useful, is to try the experiment first on a moderate scale.

2. Muck, in its common wet state, being about seven-eighths water, it is important to dry it; if for use as an absorbent of liquid manure, when already saturated, it can take in no more. If thoroughly dry, it will absorb and hold several times its weight of liquid manure, and here lies one of its valuable qualities. A very common reason of its partial failure or the little value found in muck, when used as an absorbent, or in compost heaps, is from this very reason—the absorbent has already taken up all the liquid in the form of water that it can hold.

It is not therefore to be thoroughly dried if practicable; and at least partially dried in any case. It is therefore important, both as assisting in the removal of the water, as well as facilitating the work of drawing out, to drain the swamp, beforehand, when an outlet can be had. But whether drained or not, the muck must be placed on as dry a spot of upland as can be had. The drainage of surplus water from the heap, and the exclusion of moisture otherwise absorbed from the earth below, could be facilitated by placing the muck-heap on a bed of rails, poles, coarse brush, or loose planks or slats. When the heap is finished, cover it with a thatch, to throw off rains, and admit evaporation through the thatch; or a shed placed over it, far enough to allow the winds to blow freely between the two, would answer well. In the course of a few months, the heap may be dry enough to use. A small heap will, of course, dry sooner than a large one; and a long one sooner than the same amount in a compact heap.

This dried muck may then be used to great advantage in forming compost heaps. The manure and the muck should then be placed in thin alternating layers—the thinner, the more perfect and easy the final intermixture in stirring over. Usually, about twice as much muck may be employed as manure, but the exact proportions are not essential. There should be enough muck to absorb the liquid and volatile parts, and this will depend partly on the character of each. If the manure is fibrous or with much straw, a less proportion of muck will do than where

the manure is rich and solid; and where the muck has had clay washed into it while forming, less will be required than when it is exclusively vegetable.

To save labor in mixing over compost heaps, they should be made long, and rather flat, and then the working over may be done with ploughs and harrows, drawn by oxen or horses, by throwing the material alternately out and in.

In using muck for littering stables, it is especially important to have it dry. Wet muck is bad for the animals to stand or lie on, freezes easily, and absorbs little or nothing, after being previously filled with water. Here is the secret of so many partial or total failures in littering. Anyone can easily imagine the great difference in value between a mass of muck already soaked with water to repellent, and another mass where all this water is replaced with an equal amount of liquid manure. The difference is so great as scarcely to admit of comparison.

It is of less value for cattle-yards, because even if dry it soon becomes wet through by rains from above and absorption from beneath. It is better, therefore, to confine its use to covered sheds, unless easily had in great abundance for covering the barnyard.

A small portion of lime in powder, or of wood-ashes, may be advantageously used in forming the compost heap already mentioned; and these may sometimes be employed with advantage to neutralize the acids existing in fresh muck, and fitting it better spreading on land, when not mixed with yard or stable manure. The value of this mixture will greatly depend on the condition of the soil as to vegetable soil.

Thin Seeding of Wheat.

The following from the *Mark Lane Express* gives the favorable side of the question of the "thin seeding" of wheat. There is much to be said on both sides, this is one side:—

"The first instance we shall allude to in thin seeding is that of Jethro Tull, who about the beginning of the last century occupied a farm or farms of 200 acres of his own, which he cultivated on perfectly novel principles, the first and foremost of which was "that thorough tillage is competent, with or without manure, to secure the profitable growth of any given species of cultivated plant year after year in succession." This theory he carried into practice for upward of thirty years with so much success that, instead of impoverishing the soil, he let off a part of it at one-third more rent than he had previously been given for it. He introduced the practice, more recently adopted by the late Mr. Smith, of Lois Weedon, of sowing half the land in proportions to three feet, embracing three rows, having unsown intervals of the same breadth between them, and he found that he could grow heavier crops on half the land than his neighbors did on the whole. Mr. Smith, too, practised this plan for nearly twenty years, and produced on half the land from thirty-five to forty bushels of wheat per half acre. The amount of seed sown was from one to two pecks per acre, no more being ever applied. Mr. Hallett, of Brighton, offers another example of this seeding. His farms or farms consist of about six hundred acres, a considerable portion of which consists of "down" land, having from four to six inches of soil lying on a chalk subsoil. It is unnecessary to go at length into the system adopted by Mr. Hallett, whose object is to produce a quality of wheat founded, like superior cattle, on an authentic pedigree. His system embraces thin seeding as a first principle. Thus, sown early, one hundred acres are seeded at the rate of one bushel to six acres, while the latest sowing is one bushel per acre. Mr. Hallett's neighbors seed at the rate of three bushels per acre; he therefore saves in seed alone from one hundred and eighty to two hundred and eighty bushels. As a sample of what may be done by this system, Mr. Hallett hired a large field, belonging, we believe, to the corporation of Brighton. It was such a barren spot as to be considered actually incapable of growing wheat. We saw this field under wheat seeded at the rate of one peck per acre, the product of which was a crop of forty-eight bushels per acre. One good effect of thin seeding is the entire absence of "under-corn"—that is, weak and short plants holding inferior ears and containing thin and imperfect grain. Heavy seeding always produces this defect, which detracts from both the quality and quantity of the return. There was no such under-corn in Mr. Hallett's crop, the ears being all one height, and as level on the top as a table.

Another case is that of Mr. Piper, an Essex miller and farmer, who, for twenty-five consecutive years, grew wheat every year without manure, except a dressing of soot, and without ploughing the land, using only a hoe to scuffle in the seed, and planting in at the rate of one and a quarter pecks per acre. It was said that the produce exceeded by a quarter (eight bushels) per acre, more than obtained by the neighboring farmers, and in one season reached to seven quarters per acre. Like Mr. Mechi, Mr. Piper was accustomed to send annually a printed statement of the profit and loss accruing in the season. Mr. Miller, the curator of the Botanical Gardens at Cambridge, inserted an account of the experiment which he undertook, in the *Philosophical Transactions of the Royal Society*:—"In the month of June, 1866, sowed some wheat; and on the 8th of August one plant was taken up and separated into eighteen parts, and replanted. These plants were again taken up and

divided, in the months of September and October, and planted separately to stand the winter, and this division produced sixty-seven plants. These were again taken up in March and April and produced five hundred plants. The number of ears thus formed from one grain of wheat was 21,100, which gave three pecks and three-quarters of corn, estimated at 576,840 grains. The land was of medium quality, and no manure applied."

An acre of land contains 43,360 square feet; three bushels of wheat contain at the rate of Mr. Miller's wheat, 1,832,531 grains, which, divided by 43,460, the number of square feet in the acre, gives 42 grains of seed to the square foot! Is it surprising that frequent failures of the crop should occur with such crowding of plants which, like human beings, can only be healthy and strong with plenty of room to develop their productive faculties?

MAKING SOUR HAY.—The Austrian system of making sour hay is very simple. It consists in digging long graves or trenches, four feet in depth by six or eight feet in breadth. The newly-cut clover and grass is crammed into the trench and tramped tightly down. When the trench is quite full, so that the contents are a little above the surface, the whole is then covered up with a foot or fifteen inches of earth, just as a heap of potatoes is covered. Prof. Wrightson states that the preservation is complete, and the wetter the fodder when it goes together the better. No salt is mixed with the grass. He further states that this "sour hay" affords a capital winter fodder, and when cut out with hay spades it is found to be rich brown in color and very much liked by stock. The pulp left in the manufacture of sugar from beet is also preserved in the same way, and, it is stated, will keep fresh for five or six years. Although Prof. Wrightson does not say so, still we imagine that green vetches may also be stored by the same method. When we formerly referred to this matter we expressed a wish that some of our readers would make a careful trial of the Austrian mode of preserving green fodder.—*London Times*.

CLOVER AND WHEAT NEVER BOTH SUCCESSFUL.—Mr. W. J. Towler, a noted agriculturist of New York State, writes:—Clover generally makes a poor growth in hard or baked soil. On heavy land, at least, the mellow and deeper the soil, the better will be its growth. Experience has convinced many farmers that a mellow seed bed, two or three inches deep, resting on a firm and rather hard substratum, is better for wheat than to have the soil mellowed to great depth. But what is best for the wheat crop is not best for the clover catch. I suspect that the difficulty often experienced in getting clover after a clover sod, originates in the fact that farmers have learned to only plough their summer fallows once, and do all after cultivation on the surface. Under the old fashioned practice of cross ploughing the summer fallow one or more times, the clover made a rampant growth, though the mellow soil absorbed a great amount of water and frost lifted the grain badly. The luxuriance of the clover is generally in inverse proportion to that of the wheat. Possibly something is due to the fact that a heavy grain crop dwarfs the growth of everything else; but I am also convinced that the conditions for the best growth of wheat and of clover are, in many respects, dissimilar. With the largest possible wheat crop, there will be little or no clover. Probably a better way, where the soil is rich enough, is to grow two wheat crops in succession—the first a large crop without seeding, and the second showing less wheat, but getting the field well seeded with clover.

CLAY FOR SANDY MEADOWS.—Sandy lands that are yielding poorly may be improved often at little expense by top-dressing with clay. We have seen meadows made to yield largely, simply by dressing with a thin coating of clay hauled from an adjacent bank and scattered over the field during winter, where, by the action of frost and the spring rains, the clods were reduced to a condition to be easily broken and further distributed over the surface. Heavy clay lands are often benefited by dressing with sand or sandy loams. Fields are often located at a short distance from deposits of clay or sand, and may be permanently benefited by top-dressing in the way suggested. Sandy and leachy soils that are not retentive of manures may thus be often so ameliorated as to be made very productive and at comparatively little expense, if deposits of clay are near at hand. A few years ago a farmer living in the valley of the West Canada Creek had a large field of sandy land which was so unproductive as to be considered of little value. The land was ploughed in the fall and during winter the farmer set his teams drawing clay from a bank near the creek and close at hand. In the spring the clay was distributed over the surface as evenly as possible and harrowed in, and the field was then sown with grain and seeded down to grass. A good meadow was thus obtained, which proved productive for a number of years, though only a light coating of manure was applied from time to time, the field getting no better treatment in this respect than other parts of the farm where the soil was stronger and better. We have no doubt the field referred to would receive benefit by an application of clay, and we should take the risk of making the experiment on a small scale, to say the least; then, if the improvement and cost of adding clay proved satisfactory, a more extensive surface could be treated.—*Rural New Yorker*.

Horticulture.

Management of Orchards.

A very commonly accredited, but erroneous impression regarding fruit trees is that their roots extend on every side to a distance equal to the height of the trees. It is scarcely necessary to say that double that distance would, in most cases, come nearer the mark. A knowledge of this fact, together with the depth and general character of roots, is necessary to the proper culture of orchards. Three different modes of cultivation are followed,—1st, the surface of the entire orchard is ploughed or scarified close up to the trees; 2nd, circles of unbroken sod, about ten feet in diameter, are left surrounding the trees; 3rd, circles of about the latter size are cultivated around the trees, the rest of the orchard being left unbroken. Which of these modes is best? From a recent report of the American Pomological Society we gather some light on the subject. An orchard had been treated in part in the three different methods mentioned. The soil was an ordinary medium loam. The first plan was followed by "a great increase in the vigour of the trees"; the second showed "no apparent difference" in this respect, nor was the third attended with any appreciable benefit—from which we would conclude, taking these experiments as our criterion, that the culture of the entire surface, close up to the trees, is the most profitable for orchards; also, that the very prevalent method of spacing circles around the trees, or leaving unbroken circles around them, and cultivating the rest of the orchard, is followed by but trifling advantage, unless in the former case the circles are made very large, and in the latter very small. Another desideratum in the management of orchards is the depth to which roots penetrate. This depends to some extent on the soil. Where the subsoil is hard and poor and its fertility lies mainly near the surface, the cultivation must be proportionately shallow, and an occasional top-dressing of good barnyard manure is highly recommended. Where the soil is rich, and deep on the other hand, the roots penetrate to a much greater depth. In the case cited many of them were two feet below the surface, and some extended seven or eight feet into the earth. In such a case one mode of surface culture seemed to answer as well as another, for none of them was followed by any marked effects. It should be observed however, that the deep-rooted trees were mostly old. In perhaps most soils the average depth of roots is about a foot below the surface and this depth is most favourable for cultivation. Considerable difference of opinion exists as to the relative merits of, on the one hand, keeping the surface mellow and free from grass or weeds, and, on the other, allowing the ground to become covered with grass. It seems plain to us that no general decision can be rendered upon the point, for everything must be determined by circumstances. If the trees show any signs of rankness or succulence, let the land be seeded and their growth checked; if they are feeble and their annual shoots short and stunted, then their vigour must be increased by cultivation and manuring. The thrift or unthrift of a tree may generally be judged from the length of its yearly shoots. In young orchards these should not be under two feet, and in the older ones not less than one. As to manuring a grass surface, or cultivating it simply without manure, it is safe to say that both methods will go best hand in hand; but where cultivation is very difficult, of course the other must be mainly relied on. One of the most common causes of failure in young orchards arises from crowded growth,—grass being allowed to grow up and check the young plants. The shoots of an ordinary peach tree in clean, mellow soil, will grow from two and a-half to three feet in a single year, but set them in grass plots and the growth will rarely reach one foot in the same time.

Raising Turnips.

EDITOR CANADA FARMER:—Allow me a little corner in your paper for a quiet confab on the raising of a very important crop, turnips.—Important inasmuch as it, in a great measure, encourages the feeding of the coarse grains on the farm, and thereby adds largely to the value of the

manure heap,—a most important consideration. Also, the turnip crop is pre-eminently a weed-killing crop.

A pretty successful experience of about twenty years in raising turnips, has given me the impression that I am "some" on that line of production. I will therefore give you my mode of procedure: Take a sod field of two years' standing; give it a liberal dressing of well rotted barnyard manure—for "muck is the mother of nips"—spread it in the fall; the rains will wash all the soluble portion into the surface of the soil; plough early in spring, rather deeply, in wide lands, the wider the better; then harrow well, and after a few weeks cultivate and re-cultivate until the soil is well pulverized to the depth of about four inches. Then drill into rather flat drills about twenty-eight or thirty inches apart, and sow from the 15th to the 20th of June, 1½ lbs. to the acre. Carter's Improved, East Lothian, and Fine Westbury are good varieties. I have not very much faith in either plaster of Paris or salt, though, under certain conditions, they may give the young plant a little start. It is well to run the scuffler through the turnips before thinning out, which must be done promptly before the plant gets tall and spindly. With regard to what distance apart the turnips should be left, there is great variety of opinions. Many leave them eight, ten, and twelve inches apart. I prefer from fifteen to eighteen. I believe that one half of the turnips raised in the country are greatly injured by being too close together. The turnip requires both sunlight and air for full development; also there is much less labor in every part of the work when wider thinning is adopted. I am fully con-



The Dahlia.

vinced that, by wide thinning, the turnip grows much larger, and yields a considerably greater tonnage to the acre. I consider also that it fails less frequently than any other crop. From 500 to 750 bushels per acre, is a fair average yield with the above treatment. In a future letter I will state my method of taking up, hauling in, storing and feeding this valuable crop, pre-eminent as a weed-destroyer, a cattle fattener, a muck maker, and a fetcher of the "gowden dollar"

S. Dumfries.

Taking up Dahlias.

When the first frost strikes the Dahlias so as to blacken the plant, a few inches of soil should be added to the crown of the plant, to prevent injury to the tubers by freezing, which might happen on an unexpectedly cold night. Taking some pleasant day on the last of October or beginning of November, the tops of the plants should be cut down near the ground, and the stalks pulled up. This is best done by two persons, with spades, operating on opposite sides of the roots simultaneously, as when taken from the ground, they are very brittle and easily broken off. Let them be carefully deposited on the surface where they should remain during the day, exposed to the sun and air. Before night sets in, remove them to a dry, airy cellar, and place them singly on shelves raised a few feet above the ground. Here they will be perfectly safe, pro-

vided a little air is now and then afforded them in pleasant weather. Rats and mice will do them no injury. Our illustrative cut is from the catalogue of Mr. Rennie.

Growing Roots, Kohl Rabi and Cabbage for the Farm.

No. 4.

(Concluded.)

Now the writer is prepared for all sorts of objections and criticisms on his plan, people will *not think* as to what may be done, but would rather not use their brains, and depend on what is *already done*. To meet these objections at the fountain head, the following is fearlessly advanced:

First, there is nothing new in it and nothing which is untried; all has been tried and proved a thousand times: No one will doubt, who has attended the Provincial and agricultural shows, that enormous turnips, beets, mangels, carrots, &c., can be raised in Canada and can be produced by the month of September or October, in which the Provincial Exhibition takes place,—for *there these gigantic roots are*, for fools and unthinking people to stare and wonder at. Well, the writer asserts that every one of those roots were raised under glass in the manner here recommended and most of them were transplanted. The monstrous yellow globe mangolds lately exhibited in Toronto, were all transplanted, and must have been moved from the glass frames on to the old rotten manure heap on which they were grown. The same observation applies to other roots except that where it is necessary to get the roots cleanly grown, and without forking, they were raised under glass in the place where they finally stood and grew.

So much for experiment! growth, now for field culture:

The first person who is known to have raised transplanted Swedish turnips as a field crop, was the celebrated William Cobbett, the English reformer and author. He introduced this system of transplantation at Botley, Hampshire, England, and carried it on for many years with great success. It is fully described in Cobbett's *Weekly Register*, Cobbett's *Agriculture*, and his *Cottage Economy*. The writer, about fifty years ago, saw a field of these transplanted Swedes or about ten acres, harvested. The turnips were simply enormous. As they stood on the ground with the roots cut off, ready to be dug, they had the appearance of small bee-hives, such as are made from straw in the old country, and the roots weighed from 12 to 16 pounds each. They were mostly all coarse and ugly; there were very few among them that had not quite a bunch of tap roots, and many had several heads of leaves. The crop, as a whole, must have doubled or trebled in weight any ordinary crop of Swedes grown in the usual manner from seed. And Cobbett always affirmed that he grew roots in this manner with great profit. He had not, however, the aids which we here propose to save labour and insure exactitude in planting. In the whole of this field no small turnips could be distinguished.

In growing a crop of roots of any kind, and in considering the question, one great fact must be always borne in mind, viz.:—"That a crop of roots when obtained contains within itself exactly *four* times as much of mineral elements as does a crop of wheat, that is to say:—Were you to take a crop of wheat (straw and grain) and burn it carefully, and collect all the ashes and then analyze them, you would have just one-fourth as much potash, lime, soda, phosphates and other mineral matters as you would if you were to dry and reduce to ashes a crop of roots, including their leaves, and then analyze their ashes. The ashes of these plants would contain four times as much of these mineral elements as the ashes of the wheat and straw."

Now these mineral elements (which really constitute the fertility of the soil) must either have been abstracted from it by the roots, or, by some process which we do not at present understand, have been made in it by the roots from its natural substance, the earth. It is quite clear that the mineral elements being impossible to be destroyed by fire, and many of them being insoluble altogether even from the ashes; could not have been obtained from the air, and it is self evident that the results of a crop must have been obtained from the two sources, the soil and the air; for there is no other source from which they could come, except from the seed, and that is too trifling an element to be taken into consideration. Hence, if we raise a crop of roots from

the soil and remove the roots and the manure resulting from them from the soil in which they grew, we have injured the soil instead of benefitting it, whereas, if the roots are consumed on the land by sheep (or destroyed on the land by the frost catching our exposed crop before we have time to harvest it) the soil on which these roots grew is in the most fertile possible state, from which to make the money product, such as wheat, barley or other grain,—whereas, if you remove the crop of roots from the land and don't restore the manure to it, you have impoverished it to a most serious extent, and, if the practice were continued, you would put the land into such a state that it would not produce roots at all,—this is the cause of the "finger and toe" in the turnips, in the old countries, by continual growth of turnips on the land. And by the consumption of those turnips on the soil by sheep you have carried away in the bones, flesh and wool of the sheep, an undue portion of the lime and the phosphates, which the soil contained, and those roots cannot be again obtained on the land until you have restored this loss by artificial means, and have brought the abstracted lime, phosphates and other mineral elements or an equal quantity of them back to the land, when it is found that the finger and toe disease ceases, and turnips are as successfully produced as ever.

So it is with clover—if too many crops of clover are produced on soil and that clover is removed from it in the shape of hay—after a time the land becomes clover sick, and will produce no more clover until the abstracted elements are restored, when the clover "takes" as well as ever.

It will thus be seen that if you raise a crop of roots from land and don't restore the elements which they have produced "to the soil in which the roots grew" your soil is so much in reality the poorer, and is only benefitted by the cleaning and destruction of weeds, which is done by the hand and horse hoe.

Toronto.

SUBSCRIBER.

To Prevent Hyacinths having Short Stems.

Get some stout brown paper and cut it into squares of a suitable size, and then roll them up into funnels similar in form to the pointed bags in which grocers put moist sugar. They should be from six to nine inches long, and as soon as rolled into shape, pasted up the edge to keep them firm; if, for plants in pots, the base of the funnel should be large enough to go over the bulb and a portion of the soil; if for glasses, it should fit the outside of the upper rim of the glass. The pointed end should be cut off, so that when placed over the plants, the light will come in at the top only; the slower-stem will rise up rapidly to reach it, and as soon as it is as long as you desire, take off the funnel and allow it to bloom. After a little practice with this method you will be able to grow them all of a height, which very much enhances their beauty where a number of them are arranged in a window.—*Gardener's Magazine*.

Packing Grapes.

I wish to offer a few suggestions to the grape growers in reference to packing grapes for shipping to market. The manner of packing has much to do with the condition in which they arrive in market, and the condition has much to do with the price obtained.

In the first place grapes should never be gathered when wet with dew or rain. The best method that I have tried for gathering grapes, is to take a pair of sharp shears (pruning shears answer very well) or a sharp knife with hooked blade; take hold of the bunch with one hand, and cut the stem of the grapes with the knife or shears held in the other hand, and take off all green or decayed berries; lay it carefully in a basket, then proceed to the next; when the basket is full, carry it to the place of packing, which should be under roof. The next operation is to pack them in boxes, which should be both light and strong; twelve by eighteen inches, and four or five inches deep is a convenient size, and will hold from sixteen to twenty pounds if properly packed. To do this right will take some experience. I would recommend that the boxes be set on a table of convenient height, having the back end of the box elevated three or four inches by placing something under it; then commence at the end next to you and lay the bunches in carefully, pressing them together gently, but not hard enough to break the berries. When the bottom of the box is covered one layer deep, commence at the front again, put in a second layer, placing the larger bunches in the low places, thus keeping them as level as possible. Proceed in this manner until the box is full,

being careful to have the box as level as possible when done. Cutting bunches to fill up cavities is not a good practice, as large bunches sell best.

When the box is full set it aside and proceed to fill another, and so on until all are full. The boxes thus filled should be allowed to stand until the stems of the grapes are wilted and become pliable, which will take from six to twenty-four hours; then take a board and cover the box, placing one hand under the box and the other on the cover; then set the box on one end, holding the cover securely in its place with one hand, then shake or jostle the grapes till they settle compactly together, which is easily accomplished after the stems are wilted; this will cause a cavity at the upper end of the box, which should be carefully filled with grapes that have had stems wilted, in order that they may pack closely. Great care should be taken to avoid rubbing the bloom off the grapes, as it injures their appearance, and it is thought they will not keep as well. Care should be taken to hide the stems of the last layer, and have the stems look even and level on the top. Grapes should not be allowed to stand in the sunshine after they are gathered. Grapes transported according to the above directions can be carried a long distance without injury.

The Novelty Flower Stand.

The article here represented, something of an originality in its way, is designed to answer a double purpose—first, to serve as an ornament, and secondly, to economise house room. In wintering flowers in the house, pots are usually stuck away in every conceivable corner, where they are almost sure to be in somebody's way, and where, with constant knocking about, they are frequently found in a sorry plight when spring comes round again. In summer, too, window-sills, door-steps, temporary shelves, and many other inconvenient expedients have to be resorted to for the ornamental display. The object of the Novelty



Stand is to meet both these objections, and it does so admirably. The plates are moveable, so that it may stand near the window or walls, or at a distance from either or both. A very pretty selection of flowers for its decoration may be made from among the following, all, or nearly all of which will bloom during winter. Zinnia, Centaurea, Clarkia, Parilla, Stocks (Winter), Aster (Dwarf), Fuchsia, Geranium, Phlox Drummondii, Grandiflora Splendens, Petunia, Linaria, Maroccanna, Ice Plant, Jacobaea.

Fall Planting.

The first thing every planter or person who is embarking in fruit growing should have on his mind is success, and to be successful, losses must be guarded against, land must be as closely planted as kinds will allow, so that for the expense of cultivating and hoeing a row of trees or plants, no vacant places are found in the row that bring no returns for labour bestowed. How many of us can remember scattering plantations where the yield was light, yet labor heavy; rows of raspberries imperfect, yielding one bushel of fruit, while the next row of the same kind, with no more cultivation, yields two to three bushels—one is a perfect row of bushes or plants, the other imperfect. The causes of these failures are more due to late setting of plants in the spring, after spring rains are over and dry

weather is coming on, than to anything else, unless it be poor plants. Young, newly-set plants must have moisture, and get well set in their places and start to grow before dry weather comes on, so that either fall or very early spring planting is necessary. Now, as all of us have plenty of time to set in the fall, and set well, while early in the spring are pressed for time, certainly it is better to set in the fall. "But will it answer to set in the fall?" we are asked. Yes, if properly done and cared for. The first thing necessary is to have a dry location, and if not sufficiently so, plough the piece in lands two rods in width, leaving deep dead furrows to carry off surface water.

If it be fruit trees, work the soil well around the roots and tramp down hard, and bank up around the tree a cone of earth, which answers two purposes, first, to keep mice from gnawing the trees below the snow line, and second, to prevent trees from swaying back and forth, and in the spring, draw these mounds away.

If raspberries, blackberries, currants, gooseberries or grapes, either bank up well over them, and draw away in the spring, or else put right over them a large forkful of coarse manure—this manure acting a double purpose—enriching the plants with the soakings, and protecting the plants from severe freezings. The best luck we ever had with black raspberry plantations was with one set in the fall. We had plenty of time. The plants were well set, roots being spread out well, earth scattered around them, and after being set the ground was "spatted" with the hoe right over the plant to show where they were, and when winter set in in December, and the ground was well frozen, we drove right over the plantation, putting a shovelful of manure on each "spatted" place. In the spring we passed over the plantation early with a harrow, drawing most of the manure from immediately over the plant, and working it into the soil. This harrowing was done as soon as the ground was settled and dry in the spring, and before the plants had started much; and by thus going over them early, weeds that were just starting were destroyed so completely that the raspberries had made a growth of 3 to 6 inches before any weeds made their appearance.

One cause for so many vacancies in raspberry and blackberry rows is that the sprouts start so early from the crown of roots, that it is almost impossible to remove them without breaking them off, and when once broken off they are not likely to start again, or if so, start so late in the season that they make a weak, spindling growth. If planted in the fall the roots get well settled, and not being disturbed in the spring, start early and make a good growth the first season. We are confident if our readers try fall setting, and give them the protection required, they will never go back to setting in the spring, when all is hurly-burly.

Strawberries, as we have stated in a former article, we would not advise setting large plantations in the fall north of Virginia and Kentucky, unless on light soil that does not heave; but for a small garden being where well set and protected by a little mulch, by setting now (and the earlier it is done the better,) a fair crop can be had next season. In Southern sections we advise fall setting, especially if plants are to be ordered from the North. In setting all kinds of small fruits, cut the old wood back close to the root, as it is useless, and in fact if left on, weakens the first season's growth.—*Mail Recorder*.

FACTS ABOUT TUBEROSES.—The same tuber never produces flowers more than once. After this the old tubers are worthless. But a mass of bullets will be found clinging around the base of the old tuber. If these are removed, kept in a warm, dry place during winter and planted out in warm, rich soil in summer, they will become blooming tubers the third year. A box of dry sand in a warm closet is the best place for wintering all such bulbs. They should never be exposed for any length of time to a temperature lower than fifty degrees Fahrenheit, nor planted out in a northern climate earlier than the 1st of June. A slight chill will blast the flower germ in the centre of each tuber. Then, although the bulb may look fair on the outside, it will produce foliage, but will not blossom.

ROOT PRUNING—Much has been said and written upon the benefits to be obtained by root-pruning, and various are the opinions as to the time when the work should be done. After some thought, a good deal of reading, and more or less practice for a period of over forty years, I come to this decision: If root-pruning is to be done (and much depends upon the condition of the tree relative thereto), then it should be as soon as the fruit shall have been gathered, and in case of trees that have not borne, and are rather luxuriant, the earlier the roots are cut the better, so as to fall on the fruitfulness next season; and root-pruning will do very much in proportion to the dry, sunny character of the autumn. When fruit trees are young and very luxuriant, it is often advisable to take up and replant as soon as the terminal bud of the season's growth has ripened, and before the leaves have fallen. In general, with well-established dwarf trees, which bear rather freely, little root-pruning will be necessary, and that should be given a little at a time, cutting the roots a little on one side of the tree this season, and on the other side in the following season. This once done, and some rotten dung used as a mulching every year, the roots will be so encouraged near the surface, that little more cutting of them will be necessary.—*F. R. ELLIOTT, in Country Gentleman*.

Live Stock.

Cross-Breeding Sheep.

EDITOR CANADA FARMER:—Has the cross-breeding of sheep proved a success in Canada? This is a question which every breeder in the country should examine closely before he tries the experiment. It has been principally and most extensively practised in the long-woolled breeds. Are these cross-bred sheep then superior to their pure bred parents, such as Leicesters, Cotswolds and Lincolns? The first and most important fact to be kept in view in pursuing a system of breeding is that result of a fixed natural law which is expressed by the phrase "Like produces like," but, in order that the progeny may resemble the parents to any degree of certainty, the parents themselves must have a very strong family likeness to one another in symmetry, constitution, quality and style of wool, &c., and this resemblance must have extended over several preceding generations; otherwise there will be but a very slight probability of their transmitting these qualities with uniformity or force to their offspring. Now if such is the case, why cross different breeds having having different individual traits of character, unless the offspring be intended directly for the butcher? Why attempt to obtain what can be got only through careful selection for several generations; or why destroy that individual and family likeness merely for the sake of crossing, when it is a well known fact that such crosses, if bred from again, will not produce progeny like themselves, but, as a general rule, inferior to the parents from which they spring? I will take an example: It was the fashion some years ago to cross the Leicester and Cotswold for the purpose of producing a sheep for the show ring, an animal which did indeed attain a greater size and a heavier fleece, and frequently carried off the prize from its more worthy ancestors. But did they succeed in breeding from these sheep a class having the same family likeness as themselves? I trow not. If any person will take the trouble to examine a flock bred after this fashion, they will find that their most prominent characteristics are long legs, long slender necks, narrow chests, and a general flatness over the ribs, all of which points are infallible indications of constitutional decline and a lack of any tendency to early maturity, or good feeding propensities. And now, the Leicester and Cotswold crosses having failed, an attempt is being made to put the Lincoln through a similar mill, but I have no doubt the attempt will be followed by equally unsuccessful results, for the same law governs in all cases; there is no such thing as luck or magic in breeding sheep, as many of our American cousins know by this time to their cost. Two or three years ago quite a fever for long-woolled sheep raged across the lines, and the longer the wool and larger and coarser the sheep, so much the better, blood and quality being of little, if any, consequence. But the unalterable, fixed law was found as stable over there as among other Christians, and I doubt not but ere this many of them have fully realized their disappointment in the off-spring produced.

CANADIAN.

N. Dumfries.

Can Sex be Produced at Will?

It has for a long time been a subject of much discussion among scientific men in the medical profession, to establish definitely whether in the higher order of animals, there could be any rule introduced whereby the production of the sexes could be regulated at will. The importance of such a discovery may be better understood, and its value more thoroughly appreciated, when application is made, and trustworthy results obtained in the reproduction of the domestic animals. For example, nearly every breeder desires sometimes that the offspring resulting from the intercourse of certain animals which he may possess, shall be males, while of others, females. Their pecuniary value may be greatly enhanced, at times, by such a regulation.

It appears that science has at last, with analytical research and scrutinising care, unlocked the door to these mysteries, and laid bare the simple means by which these ends may be accomplished. Prof. Thury, of Geneva, has shown how males and females may be produced in accordance with our wishes. He says, 'if you wish to produce females, give the male at the first signs of heat, if you

wish males, give him at the end of the heat.' The truth of this law has been sustained in practice, and Geo. H. Napheys, A.M., M.D., of Philadelphia, in one of his recent works, says on the subject, that he has now in his possession the certificate of a Swiss stock-grower, son of the President of the Swiss Agricultural Society, Canton de Vaud, under date of February, 1876, which says: 'In the first place, on 21 successive occasions I desired to have heifers. My cows were of the Schurtz breed, and my bull a pure Durham I succeeded in these cases. Having bought a pure Durham cow, it was very important for me to have a new bull to supersede the one I had bought at great expense, without leaving to chance the production of a male. So I followed, accordingly, the prescription of Prof. Thury, and the success has proved once more the truth of the law. I have obtained from my Durham bull, six more bulls, (Schurtz-Durham cross), for field work, and having chosen cows of the same color and height, I obtained perfect matches of oxen. My herd amounted to 40 cows, of every age. In short, I have made in all, 29 experiments after the new method, and in every one I succeeded in the production of what I was looking for—male and female. I had not one single failure. All the experiments have been made by myself, without any other person's intervention, and consequently, I do declare that I consider as real and certainly perfect the method of Prof. Thury.'

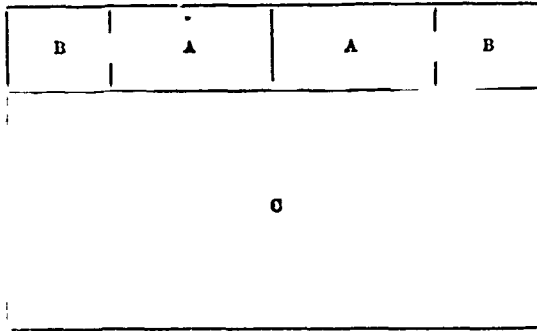
The same plan has been tried on the farm of the Emperor of France, with, it is ascertained, the most unvarying success, and we believe it has also been tested, to some extent, by parties in this country.

There is a theory among agriculturists to the effect that the weather influences and determines the sex; dry and cold, with notherly winds, producing among mares, ewes and heifers, more males, while seasons of an opposite meteorological condition, more females. The truth of this latter theory is difficult to prove, and is, besides, based upon the conditions that are beyond the control of human agencies, and therefore, of little avail to mankind; but the former statement is susceptible of demonstration, and is so simple in its operation, that the experiment may be easily tried and adjudged by any one.

A common sense view in discussing the subject of procreation suggests that it is not a matter of chance, but is, from the very character of its importance, governed and controlled by natural and fixed laws, the perfect understanding of which may, or may not, be within reach of human intelligence.—*Journal of Agriculture.*

A Convenient Piggery.

Let me give your readers a plan and description of a piggery, or hog-pen, which I recently saw in Southern Indiana. The general plan may be seen by the following:



The apartments A A are feeding pens, with troughs next to the large apartment, C, which is used as a slaughter house at killing time, and as a wagon-shed and tool-house at all other times. The parts marked B B are sleeping pens, with small entrances from feeding pens. The building is thirty feet long and twenty wide. The pens are eight feet wide, the sleeping pens five feet, and the feeding pens ten feet long. The large apartment is sixteen feet wide. It has hooks in the joists for hanging hogs, and a chimney is arranged so that a heater of some kind can be used in the building at butchering time. Above is a room for grain, with access by a stairway at one corner. In the building we visited, there was a brick furnace with pan for heating water, and the women were using it to heat wash water. It made a very comfortable wash-house in warm weather. I forgot to state in the proper place, that the pens were separated from the apartment C by a partition from floor to ceiling, with holes about five feet from the floor, for throwing in feed, and spouts piercing the partition and leading to the troughs for slops. The building cost about one hundred dollars, and was an ornament to the place.—*Cor. Ohio Farmer.*

Sheep in the Fall.

Old, experienced sheep men will not need the advice which follows, unless they have gone through life with their eyes shut; but young farmers, who are not yet too old to learn, may profit by it. Keep your sheep in good condition during the fall. If pasture has been good,

they will now be in good condition, generally, and the owner must keep them there if he would profit by the business of sheep raising. I know by experience, that after killing frosts come and wither the grass, sheep will decline unless fed a little something extra. The grass, after frost, is not nearly as nutritious as before. Give a little grain once a day, feed pumpkins, turnips, or any other green food at command—anything to keep up the growing thrifty state, all sheep should be in at the close of the vegetable season. I cannot impress this point too closely. Sheep must be kept up during the fall months, in order to winter well and easily, and become a source of profit to the owner. Especially does this advice apply to breeding ewes. If they are permitted to run down until they are coupled with the ram, they are hard to serve, and not by any means sure. Then the progeny are, evidently greatly influenced by the condition of the ewes at and succeeding impregnation. Every careful sheep owner will adopt such methods as will improve his flock. Some men, will spare no expense in procuring a ram, but at the same time pay no attention to improvement through the ewes. One is just as important as the other. Indeed, I prefer the sheep reared by a careful man who keeps them at all seasons in the most vigorous condition, even though the blood on the male side may be inferior.

Sheep do not pay very well now unless they are good. Poor sheep are a loss any time, and especially at this time. Common sense prompts every man, then, to cull his flock. Take out the poor, the maimed, the halt, and the blind, and Spartan-like, sacrifice them to the good of the commonwealth. Those that from some cause or other have dropped back a little in condition, should be separated from the flock and especial care given them. Dispose in some way of all that are not worth taking especial pains with, and thus have your flock, at the beginning of winter, composed only of the best, and they in the best possible condition. Take the word of an old sheep man, who assures you that the next crop of wool and the lambs will fully demonstrate the wisdom of such a course.—*Ohio Farmer.*

The Cotswold, or Long Wool Sheep Business.

The Cotswold or Leicester are the sheep to raise—sheep that will shear from 6 to 10 pounds per head,—that is wool that is not all gum, dirt and grease. We can raise sheep that when full grown will weight from 125 to 150 lbs. per head. Such sheep when fattened will bring 5 cts. per pound. With the experience I have had with them, they are more hardy than the fine wools, more prolific, better milkers. They need no more care than the fine wools; do not eat any more according to their size.

I have heard of many fleeces weighing from 10 to 25 lbs. per head, but I think they would come out as did a fleece that I knew; it weighed twenty lbs. before it was sheared, when it was cleaned it weighed 5 lbs. I don't think that kind of wool pays. I read in your valuable paper many accounts of heavy fleeces—they do not state whether they are washed or not. I think the result would be different if they had been washed. I prefer the long wools; there we have wool and mutton combined. I have a yearling ewe that raised a lamb and sheared 8½ lbs. clean washed wool, the staple was 6 inches long.—*Michigan Farmer.*

What is Pure Blood.

The following remarks were made by President Welch, of the Iowa Agricultural College, at the recent Short-horn Breeders' Convention:

"While coming here to-day, I was thinking of the important subject—How long shall a thoroughbred animal be bred by crossing with a scrub before becoming pure blood? The English rule is, to cross four times with the female and five times with the male. We take half-blood and cross with a pure-blood, and we have a quarter-blood, and at the fifth cross we will have an animal that has thirty-one parts pure blood to one part scrub—that is, if we compute the cross arithmetically—but when we take into consideration the fact that the pure blooded animal is prepotent over the scrub, then the animal has but a minute portion of scrub blood. When a pure blooded Short-horn bull is crossed with a scrub cow the result cannot be computed arithmetically, for the prepotence of the thoroughbred animal over the scrub, controls to a greater or less degree the value of the progeny. The future beef and butter of this country depend on the value of crossing. I crossed a common cow, a poor milker, with an Ayrshire bull, and the result was an Ayrshire calf, resembling his male parent, and with not one perceptible point in favor of its mother; thus the scrub was almost entirely lost. It is impossible to say that a certain number of crosses will produce arithmetical results. The Short-horn bull is the most prepotent animal on earth, not particularly but generally; and for example we will take the seventeens. Suppose there have been nineteen crosses since the importation of 1817, at the present time there would be one two-thousandth part of scrub blood in a straight seventeen; (that is if it was computed arithmetically); but when you

take into consideration the prepotence of the pure blood over the scrub, you would have an animal as near perfection as it is possible to get. Where are the excellences of the Short horn but his merit and power to transmit that excellence and merit to his progeny? I recognize also, the value of strains of families. The value of a strain is that the particular family produces the best Short-horns. We often find that, by reversion, a very homely or inferior bull, if he be of good family, will breed back to some of his ancestors and produce them. The principle that like begets like seems to be the true doctrine. —*Michigan Farmer*

Feeding Calves.

Some years ago I extracted from the Useful Projects in the *Annual Register* the following on feeding calves on fresh wort; there are no directions how to make the wort; but having repeatedly used it for fattening calves, I have generally put about three quarts of water, a little below boiling point, to one quart of dry crushed malt, leaving it to stand all night, and in the morning pour off the wort, and squeeze the grains in a strong cloth, so as to get all the liquor. You must gradually accustom the calf from its first week, increasing the quantity of wort, so as not to purge the animal. The quantity of course must vary, according to what you want, fattening or rearing. A little fine flour, or rice dust, well boiled, is a good addition, and prevents extreme purging. I have this week sold a seven weeks' old calf fed on milk and wort; for the last four weeks it has had three quarts of strong wort a day, in addition to new milk; it weighed 30 lbs per qr., it was bred out of an Irish cow by a farmer's bull; no pedigree. I am satisfied that an infusion of salt with skimmed milk, and grain of some sort or cake, will wean calves better than anything else I have ever tried. I trust some agriculturists will try this plan, and I be able to give a more detailed account than I can, for I have not kept any records. —*Cor. Agricultural Gazette*

The Breeding of Oxford Downs.

I have been often asked about the history of my flock. Some gentlemen connected with the press and others interested in sheep breeding have often put some questions to me, which I have perhaps never satisfactorily answered, and I do not know of any better opportunity than now for doing so. I may say that about twenty years ago I commenced exhibiting Leicester sheep. I won't dwell upon that subject beyond saying that I believe I never exhibited a pen of Leicester shearling ewes at our Bedfordshire Society without taking a prize. I believe I always took first prize, and if I went in for two I won both. As far as my memory serves me that is correct as to the Leicesters. When I came here about thirteen years ago I had an impression that although Leicesters were nice playthings to breed for the showyard, they were not exactly what the late Mr Druce called "rent-paying sheep." I had no opportunity at that time of comparing notes with my friend, Mr Charles Howard, of Biddenham, my friend Mr Druce, and others, and came to the conclusion that Oxfordshire Downs were the coming sheep, or rather that they had already come. I therefore made up my mind to go in for them. The first thing to settle in my mind was the type of them which I should breed, and in visiting at Mr. C. Howard's, just before one of the Royal Shows, I fixed upon a sheep which as nearly as possible came up to my notions as to what a sheep should be, combining as it did the symmetry and the touch, and to some extent the wool of the Leicesters, or at any rate the quality, with the dark face and the Down mutton that people liked to eat. I hired the sheep and used him freely, and I told Mr C Howard I should never send him back again. The only difficulty I had was to get Mr. Howard to mention the price, and when I wrote him to know what I should have to pay he said, as he only would be likely to say, "if you accept the sheep I shall be very happy to give it to you." I need not tell you that I did not like to be rude, and not liking to refuse a generous offer, I at once accepted that sheep and used him very freely as long as he lived. This is an answer to one of the questions that have been put to me, "How is it that in your flock you have got such uniformity of character?" It is this, that I started with a definite idea of the sheep I wished to breed; I kept that in view, and that is the secret of the uniformity of character in my sheep, and to some extent the secret of my success. I am one of those who think it is not well to be always jumping about to different places, simply because sheep of different characters may happen to be in fashion at a particular season. I think if you mean to be successful you must have a pretty correct idea of what you want at the beginning, and never mind what anyone thinks, stick to it. When I began I was not so successful as I have been within the last few years, but if one got commended or highly commended, or second or even third prize, it was something to begin with. —*Cor. North British Agriculturist.*

Parsnips for Pigs.

I would suggest the feeding of roots to swine, especially parsnips, and beg to quote from British sources two ways of using them advantageously for store-hogs, as well as for fattening, the only variation needed being the quantity and adjuncts.

First: my mode has been to boil the parsnips, and mix with a small quantity of meal when hot. Where many hogs are fattened through the summer and early fall months the parsnips might be boiled and put away in casks or cool vaults by the end of April at the farthest, and mixed with meal when wanted. They will keep several months when well-boiled and pressed or rammed into clean casks standing in a dry, cool cellar. Second: R. Hartland, of Cork, Ireland, in March, 1848, had seven pigs killed, fattened entirely upon parsnips in the raw state, cut up in small pieces. No other sort of food or any cooking was had. The butcher stated expressly that he never had met with healthier mutes. The flesh was firm and peculiarly white, the fat beautifully thick, solid and clear. The bacon proved to be deliciously flavoured without any taste of the parsnips food.

Why should not roots be given to hogs, seeing that they increase the appetite without unduly stimulating? The gases evolved by the parsnip, ruta-baga, amber globe, the Russia turnip, the early horn carrot, seem to drive off and prevent parasites, like worms, grubs, &c., and consequently the animal cannot help gaining. Roots ought to be used more for hogs, also neat stock, including horses, (for the latter carrots are the most suitable), as affording a salutary variety not only, but causing a larger consumption of provender by fattening stock just when this is most desirable, and enabling one to feed more concentrated articles without crowding.

I found from experience that in fall and winter I could fairly balance an ample supply to milk cows of amber globe, by corn-meal, cotton-seed meal, oil-cake, &c., and *vice versa*. This course I believe to be safer than stimulating the appetite by extra salting. Roots make more juicy and tender beef, mutton and pork than aught else in cold weather. So long as pork must be a staple article were it not well to so feed and generally keep hogs as to insure their exemption from parasites like trichina, &c., or measles, enlarged liver, mange, &c.? Besides it is far more easy to market bulky produce like roots, by transforming them into sound pork, plump sides of bacon and hams, &c. Try it on, increasingly. —*Cor. Germantown Telegraph.*

Wool on a Live Sheep.

The *Trade Journal* tells us that generally the finest and softest wool is on the shoulders of a sheep. But not one person in ten thousand is aware of this fact. Let us watch an expert when he is about to pass judgment on a sheep concerning the value of the animal for producing wool, and it will be seen he always looks at the wool on the shoulders first. A writer of extensive experience in rearing fine wool sheep and in handling wool, communicated the following suggestion for selecting a fine-wooled sheep:

"Always assuming the wool to be inspected is really a fine wool, we first examine the shoulders at the part where the finest and best wool is usually found. Thus we take as a standard and compare it with the wool from the ribs, the thighs, the rump, and the shoulder parts, and the nearer wool from the various portions of the animal approaches the standard the better. First we scrutinize the fineness, and if the result is satisfactory we pronounce the fleece in respect to fineness very 'even.' Next we inquire into the length of the staples, and if we find that the wool on the ribs, thigh and back approximate reasonably in length to that of our standard, we again declare the sheep, as regards length of staple, true and even. We next desire to satisfy ourselves of the density of the fleece, and we do this by closing the hand upon a portion of the rump and of the loin wool, the fleece at these points being usually the thinnest, faulty, and if it again gives satisfaction, we signify the fact by designating the wool 'even' as respects density. Now to summarize these separate examinations: If you find the fleece of nearly equal firmness from the shoulder to the thigh, of nearly equal length on shoulder, rib, thigh, and back, and density on shoulder and across the loins, you may conclude that you have a perfect sheep for producing valuable wool. Selecting sheep for valuable feeders, is quite another thing."

Shelter for Cattle in Winter.

One-half of our farmers are in debt, and cannot afford to build regular barns. This is particularly the case in the prairie districts, where timber is scarce; yet even here they can do much toward alleviating the sufferings of the poor brutes, besides saving much feed. When corn is raised plentifully a rude shed can easily be put up without the aid of nails. On the fence on the sides of the barn from which the prevailing winds and rain came

during winter, set additional stakes, so as to cross the middle of the rails; on these lay strong rails; parallel to these, and about two or three feet less than a rail's length, set in the ground strong poles with forks, so as to lay poles or rails, but have them about three or four feet higher; now lay rails on these like rafters on a building, not more than four feet apart; tie down with strong wire or hickory withes, upon these lay light rails lengthwise, like lay upon the rafters; tie down also. Then tie the fodder in small bundles for roofing; first set upright against the fence, fodder thick enough to keep off the wind; then roof with bundles of fodder, with the butts uppermost, like shingles on a roof, occasionally tying the band of the bundles to the lath, and if heavy rails or poles can be laid on the top to keep the wind from blowing off the roof, so much the better. A few days spent at this work in the fall will be labour well spent, in the saving of feed, as well as the comfort of stock, which, if they could speak, would praise their master. When the wintry winds howl, the snow and sleet come down, cutting and smarting whoever it hits, it will do you good to see the stock snugly resting underneath. If the roof is well made, it will keep off a long and heavy rain.

Now, how many will try this? If, in our rambling around, we should see some of these simple but effective structures, we will believe this has not been written in vain. When we were farmers, we always had these fixings, although our from 30 to 40 head of horned cattle were in a warm stable from four in the evening until ten the next morning. But then we had a barn 75 by 50 feet—a thing you may not see in these parts in a 100 miles of travel. Try it, farmers, and report in the spring. —*Cor. Rural World.*

COWS AT CALVING TIME.—A correspondent writes to the *New England Homestead*: "Some farmers are always having bad luck with their cows at calving time, and they seem to think Providence is against them. Care and experience will prevent a great deal of our bad luck. Two or three of my neighbors lost cows by allowing them to drink all the cold water they wanted soon after calving. One lost a cow in this way: He put his cow in an underground stable to calve, very damp, the walls covered with ice; the cow never got up and soon died. She had cold chills, and weakness; no medicine did any good. A German had a cow about coming in, he thought she needed strength, and so gave her all the corn meal she would eat; he came very near losing his cow. I have used strong bone-set tea with red or black pepper in it for some of these troubles with success. The better way when your cow's time is about out is to put her in a stable by herself, loose at night; especially I would give but very little meal for a week before calving; bran, potatoes, roots, etc., are better; after calving give no cold water for two or three days; take off the chill with hot water; stir in a little bran, a prillful three times a day; after that you can gradually increase the meal without danger."

BRICK STABLE FLOORS.—We would not make stable floors of brick, nor of stone, if plank or any soft timber could be obtained. But, in regard to horse stalls, John Moore, of Illinois, writes as follows:—"It is a very common thing to read in agricultural papers discussions on the best materials for floors in stalls. I have my stalls floored with brick, and, after experimenting with plank, clay, and cinders mixed with gas lime, I find that brick is the best and cheapest. The method of laying is as follows: First, spread over the dirt about four inches of sand, and lay the brick—the hardest that can be obtained—on edge. After laying them take a piece of plank, say four or five feet long, and lay it on the floor, and with a heavy hammer pound it well to make it even, and, if it is properly laid, a stable floor that is rat-proof, and not liable to wear out in a generation, will be produced. —*New York Herald.*"

STOCK RAISING.—One thing should be borne in mind by farmers, who raise their own stock—and every good farmer ought to do this—and that is always to keep the best of their own animals for that purpose, no matter what temptations there may be to sell them. By adhering to this at all times, except where a fresh strain may be necessary to introduce, there will be no difficulty in always possessing a satisfactory supply of horses, cattle, sheep and swine. Breeding in-and-in for a long period may not be advisable in all cases, but any farmer with a grain of practical sense can see this and judge for himself. Sell all your "scrubs," of every kind, and by keeping and propagating from the best, the best will always be found on the farm.

MOTHERING A LAMB.—A contributor to the *Germantown Telegraph*, writing about rearing sheep, says: "It is sometimes the case when a sheep has twins that she owns but one, unless she or they have help. Usually if she is put in a very snug pen immediately after the lambs are dropped, she will accept the situation. If one stubbornly refuses to own her offspring, just put her head between two stakes driven into the floor of the pen and let her be there. I never knew one I could not subdue. By all means have a nursing bottle on hand and feed the lambs just enough to keep them hungry and smart; and if the sheep are poor milkers, give them shorts and potatoes with plenty of salt, sulphur, and water. Cut the tails pretty short at three days old, if the lambs are smart, but within the first week usually. Keep off the ticks and the lamb will be fit to sell in season for the dam to get in good order for the winter, and a sheep that comes to the barn fat is about half wintered."

The Dairy.

Preservation of Green Fodder for Dairy Cattle.

A supply of succulent and nutritious fodder for winter use is or ought to be one of the chief objects of the dairyman; for however successful he may be in securing his hay and other fodder crops in the dry state, these can never produce the same quality or quantity of milk that the same substances do when fed in their green and natural condition. A method of preserving fodder crops by *ensilage* or pitting has of late years been tried successfully in France, the process being, with some slight variations, as follows: A quantity of lucern is cut late in autumn and immediately thrown into an ordinary pit (*silo*) of about twelve inches in depth. Here it is trodden down firmly and covered with a layer of one and a-half or two inches thick of clay, the whole being afterwards covered with a fourteen to sixteen inch coating of common earth. Seventy five tons of green clover treated in much the same manner with the exception that the pits were thirty inches in depth, turned out well, and was eaten with avidity. The same with the leaves of beets, carrots, &c.

The advocates of the "*ensilage*" system claim that the process prevents the loss of the leaves which occurs when it is made into hay, and that although the cost of the process is greater than that of haying, yet it has the advantage that the work can be done at any season when the weather is neither dry nor warm enough to make hay, and that the latest cuttings may be saved without damage or loss of quality.

Maintaining the Full Flow of Milk.

During September and October they who have good cows and know how to make prime butter, should not allow the yield of milk to run down if it lies in their power to prevent it. As the pastures begin to fail in supplying food of the best quality for the production of milk, they should produce food from some other source. It is not well, as a general rule, to turn cattle into mown fields after haying, on account of the damage likely to be done to the next crop of hay. Still, if the grass was cut early and a second crop is abundant, it is well to allow cows to feed down the grass when it is in the best condition to produce milk. The supply of milk may be kept up in this way and an opportunity be given to get the pastures in better condition to produce feed. This may be done by the use of the scythe or mowing machine. The seed stalks of the grass will be cut as well as the weeds, nasties and bushes. When this is done the grass will be of better quality. By keeping the cattle out of the pasture a week or two after it is mown, they may be returned to it. At this time in the season it is well to cut the suckers out of the corn field on account of the advantage to the corn crop. No better use can be made of these than to feed them to the milch cows. It is also well to allow the cows a small feed of cornmeal or bran once a day. Cows often crave some sort of dry food at this time of the year. They relish an occasional feed of dry hay and derive a good deal of benefit from it. Of course attention should be given to the supply of salt and water. If insects are troublesome it is well to milk the cows in the barn. By attention of this kind the flow of milk may be kept up till the latter part of the growing season, when butter may be made that will keep till the next summer. —*New York Herald*.

Roquefort Cheese.

The *American Grocer* thus translates from the French the manufacture of Roquefort cheese, said to be the finest in France. It is the product of ewes tended with great care, being fed in the winter or preserved grapes, and their drink consisting of water whitened with barley flour.

In the summer they feed on the choicest artificial pastures, and are watered at brooks warmed by the rays of the sun; they are carefully guarded from all excitement from dogs or other animals, and every detail is studied that can affect the quality of their milk. The milk is taken from the sheep morning and evening, in iron pots lined with tin. It is carried in these to the farm house, where it is skimmed, strained and warmed, though never to the boiling point, the temperature depending upon the state of the weather. After this it is placed in large, deep pans for the cream to accumulate. A great amount of ex-

perience as well as a fine discriminating sense, is required to decide as to the milk which is fittest for cheese and for butter respectively. This point having been decided, the morning and evening milk, which had hitherto been kept apart, is mixed, and the milk in the pans is then stirred with willow sticks by the milkmaids. The covers are put on the pans and the pans and the milk is allowed to rest, rime having been added. Following this are several processes, such as breaking, squeezing, and filtering the curd, moulding, milling and draining. In one of these processes the new cheeses are rubbed with mouldy bread, the latter entering into the composition of the cheese, and imparting to it the necessary green ripeness.

This bread is made from the finest wheat or barley; it contains a quantity of the strongest yeast; it is thoroughly baked; after the crust has been removed it is pounded in a mortar; it is then allowed to be in a damp place until every crumb is touched; it is sifted, and when so prepared the mould actually grows through the cheese like a plant. The remaining milk is next drained off, the cheeses being placed on ground shelves for the purpose. After this the cheeses are turned twice a day for a week, and subsequently go to the drying room, an excavation facing the north, kept perfectly clean, and having metal or canvas blinds for the exclusion of dust and flies, and lined with linen-covered shelves, on which the cheeses are kept warm by relays of pails of boiling water.

The cheeses next pass into the cellar, being packed in cases of special construction, and loaded in vans slung below the axles to avoid the jolting, which would ruin them. The transit to the cellar also takes place in the night to avoid the heat of the sun. At the scale chamber the cheeses are examined, weighed and registered. This, however, is not the last stage a Roquefort cheese goes through. They are covered with salt, one surface at a time, and after two days have elapsed the salt not absorbed is rubbed in with a rough Dutch cloth. The cheese is afterwards scraped over to remove a glutinous covering or crust, and in a little over a month the cheese is ready for market. The removal of this coating of the cheese affords ample employment to a number of girls called Cabaneres, from the ancient designation of the Roquefort cellar, which was "cabin." The chief brand of the Roquefort cheese is that of the Societe des Caves Reunies, which brings from fifteen to twenty-five francs per cwt. more than any other brand of the same. About 400,000 sheep contribute their milk to make this cheese, which is the choicest French kind.

Food for Dairy Stock.

From advance sheets of "American Dairying," by L. B. Arnold, we copy as follows:

We copy from the table of Wolff & Knop, as quoted by S. W. Johnson, the nutritive and heat-producing values of some of the different kinds of winter food in common use. It may be of some advantage in adapting the different values to each other. They are arranged in the order of flesh forming material:

	Albuminoids.	Starch, Sugar, Gum, etc.	Fat.
Oil Cake	23.3	41.3	10.0
Bean Meal	25.5	45.0	2.0
Pea Meal	23.4	52.3	2.5
Alsike Clover in blossom	13.3	20.2	3.3
White Clover in blossom	14.9	31.3	3.5
Rye Bran	14.5	53.5	3.5
Lucerne in blossom	14.4	22.5	2.5
Wheat Bran	14.0	50.0	3.3
Red Clover in blossom	14.4	24.8	3.2
Oats	12.0	40.9	6.0
Orchard Grass	11.6	40.7	2.5
Rye Meal	11.0	60.2	2.0
Meadow Fox Tail	10.6	39.5	2.6
Corn Meal	10.0	65.0	7.0
Timothy Hay	9.7	44.8	4.0
Barley	9.5	60.8	2.5
Buckwheat	9.0	52.6	2.5
Common Hay	8.2	41.3	2.0
Pea Straw	6.5	35.2	2.0
Corn Stalks	3.0	39.0	1.1
Barley Straw	3.0	32.7	1.4
Oat Straw	2.5	33.2	2.0
Wheat Straw	2.0	30.2	1.5
Potatoes	2.0	21.0	0.3
Ruta Bagas	1.8	9.3	0.1
Carrots	1.5	10.8	0.3
Turnips	1.1	5.1	0.1
Beets (Sugar)	0.8	15.4	0.1

As a part of the heat-producing food must be fat, it has been placed in a separate column.

There are so many circumstances that vary the quantity of food required for the daily use of a cow, that no precise figures can be set down as representing the exact amount of the different elements necessary for her to subsist upon, but the following may be regarded as approximately correct for a cow weighing 800 lbs. when not in milk. Her daily food should contain at least—albuminoids, 1 1/2 lb.; starch, sugar, etc., 8 to 10 lbs.; fat, 1/2 lb. With a large flow of milk the albuminoids would need to be doubled, the starch, etc., increased one-half, and the fat doubled. From this it may be seen how to proportion the several kinds of food to adapt them to each other, so as to use them with economy. If the food be used dry an allowance of 1/2 should be made for imperfect digestion. If cooked or steamed the digestion will be perfect and the whole amount may be counted. This amount will be re-

quired for cattle provided with warm and comfortable stables and kindly cared for. If they have no other protection than an open yard or shed, one-half more should be added to the quantity named. This may seem a large allowance, but experiments made at the barn of the writer, and tested by actual weights, have demonstrated this difference between comfort and exposure, and the experience of hundreds of others have corroborated it.—*Boston Cultivator*.

JUMPING COWS.—I had a steer a few years ago that was in the habit of jumping, and I tried the horse tamer's girdle, made like any blanket surcingle, only stouter; and attached to the girt, on a level with the forearm of the creature, a wide strap at right angles, one" on each side, and these straps passed around the fore arm, passing between arms on inside, and coming round to buckle on girdle on the outside, and buckling up tight enough to shorten steps some. Do not put it on too tight; they would stumble over a six inch rail lying on the ground. Any person can make one by passing over the back a girdle, and then the right angle strap each side of bricket as high as can be on a level, and bring strap around forearm to girdle and buckle the fore arm back to the girdle where the strap is fastened on. This fetter is out of danger of getting hung by, and does not obstruct feeding in the least, and yet they cannot jump a two-foot fence, for they won't dare. I believe this sure proof. There is only one objection to it; it will wear off the hair on the forearm. I should recommend taking off every night and yarding to rest them.—*Cor. Massachusetts Ploughman*.

COTTAGE CHEESE.—Those who have plenty of milk and make butter have an abundance of sour or clabbered milk daily, clean and fresh, which is the article desired to make cottage cheese. The true way to make this sort of cheese is to skim the sour milk and set a gallon or two of the milk on the stove in a milk pan and let it gradually warm till it is lukewarm all through. Stir it occasionally to prevent its hardening at the bottom. When it is a little warmer than new milk, and the whey begins to show clear around the curd, pour it all into a coarse, thin bag, tie close and hang up to strain. Let it hang up two or three hours in a cool, shady place, then take from the bag and put the contents in a covered dish. When preparing it for a meal mix with the curd rich, sweet cream, sugar and nutmeg. Some prefer salt and pepper, but the sugar will give it the flavor of fruits or acids. This preparation of milk will often be found most salutary and wholesome for dyspeptics and weak, inflamed stomachs. The clabber is also very nutritious and easily digested.

BRINGING THE MILK.—Mr. Fawcett said his men had frequently come to him and said, "Such and such a cow was dry; I cannot get a drop of milk from her." His answer was: "Go and get a can and come with me." The man had laughed and said: "It's no use, Sir." However, he had placed the man on one side of the cow to milk and her calf on the other side to suck, and they had come away with six or eight quarts of milk from one side of the cow. Therefore, they must not form a hasty conclusion that they had got a very bad milker, for he had often found that by letting the cow's own calf suck on one side they got double the milk from the other side. He always lets a young calf suck on one side while they milked on the other, and one of his cows called Ruby had frequently had two calves sucking, and supplied the whole of his household, consisting of 12 persons, with milk and butter. (?) But if they had taken her calves away from her they could not possibly have got the quantity of milk. They had no idea how it encouraged a cow to give her milk by placing her calf by her side and letting it suck.—*London Agricultural Gazette*.

CURIOUS CHEESE-MAKING PROCESS.—Among the curious methods for the manufacture of fine cheese, the process adopted by Mr. Joseph Harrison of Derbyshire, England, will be of interest. The curds are not scalded, no heat being applied after the milk is set for coagulation. The expulsion of the whey, or its separation from the curds before being put in the hoop and under press, is being accomplished by a process quite different from anything known in practice in this country. But what will be surprising, perhaps, to most of our factory cheese makers is the fact that the cheese made under this process is of the finest flavor and quality and sells in the best markets of England for "top prices" on a par with English Cheddar, which ranges from twenty shillings higher than American cheese.

MR. ARNOLD gives the following characteristics of properly ripened cheese: "Well ripened cheese has no elasticity when pressed with the finger; it feels as if breaking under the pressure, and the dent remains; it has a salvy, oily appearance when worked between the thumb and finger and melts on the tongue like a ripe pear; the cut surface remains soft and oily for a long time, not readily drying up. Unripe cheese, on the contrary, is elastic when pressed, hard or tough when worked between the thumb and finger; soon dries and cracks when exposed to the air; when tasted by the tongue is found deficient in fat and does not dissolve readily."

Veterinary.

Paraplegia in Pigs.

Paralysis of the muscles of the loins in hogs is not of unfrequent occurrence, and generally exists without seemingly interfering with the general health or appetite of the animal. All that appears to be wrong is the partial or total inability of the animal to move by aid of the hinder extremities. It is generally an independent affection—that is, it is not the consequence of a pre-existing disease. Fever does not seem to be present, and complications only occur in an advanced stage of the disease, when it generally ends with hectic fever or general consumption. The causes of this disease are obscure. Sometimes paraplegia will follow a severe strain of the back, or blows on the back or loins of the animal, producing concussion of the spinal marrow. If it is ascertained to have been caused by some such injury, cold applications over the loins or back should be used for a few days. If the cause is unknown, and if no unnatural heat in the back is apparent, then it is proper to apply either a liniment of Spanish fly—one part cantharides to one part olive oil, and one part of spirits of turpentine—or, a seton may be inserted lengthwise under the skin, over the loins. The disabled animal should be placed alone, in a comfortable box-stall. Internal treatment should commence with an emetic, such as tartar emetic, four grains, powdered white hellebore and ipecacuanha, of each eight grains; mix, and throw dry upon the root of the animal's tongue. This emetic may be repeated after four days. If the bowels are costive give frequent warm water injections. Further internal treatment should consist in giving, twice or three daily, camphor, twelve grains, powdered aniseed and ginger, of each half a drachm; mix with a little treacle or honey, and smear upon the root of the tongue. Feed on sloppy, boiled food, give green fruit, and plenty of sour milk.—*National Live Stock Journal.*

Calves Weak in the Hind Limbs.

In answer to a correspondent, who asks the cause of weakness in the hind limbs and quarters of several of his Short-horn calves, the *North British Agriculturist* says: "Your calves must in some way be badly nourished. The dams you report healthy and in good condition. Was the sire equally sound and vigorous? Some delicately-bred bulls leave a large proportion of weakly rickety calves. Where foot-and-mouth has prevailed it often happens that many of the calves dropped even six months later are deficient in vigour. Severe attacks of foot-and-mouth disease are apt, moreover, to leave spinal weakness, and we know of several valuable Short-horn cows partially paralyzed in their hind extremities from attacks of the complaint from which they suffered two and three years ago. The pasture on which your cows have been grazed is admitted to be 'bad.' Although it sufficed to furnish nutriment to maintain your cows in healthy condition, there may not be an adequate of phosphates or other necessary tissue constituents for the healthy growth of the progeny. Such a fault is best remedied by giving the cows, especially during the latter months of gestation, two pounds daily of linseed and cotton cake, or six or eight pounds of bran. Your calves with good treatment will probably outgrow their weakness. They should have at least three daily a full supply of new milk, and be also early encouraged to lick a little flour, which may consist of about equal quantities of wheat and oats, finely ground together. If milk is scarce give them regularly once or twice daily a pint of well-boiled gruel, made with the wheat and oatmeal. For weakly foals and calves we have often found much benefit in the daily use of half a pint of Liebig's extract of meat, prepared in the usual way in which it is given to human patients, or still further strengthened by being beat up with an egg. Such nutriment are better than any physic."

Rupture in the Horse.

A rupture with an opening no larger than 1½ inches may be often cured by returning its contents into the abdomen by manipulation, and then raising an active blister on the part with swelling enough to form a retaining pad and prevent protrusion. Cantharides, two drachms; oil of origanum, one-half drachm; lard, one ounce, will do if well rubbed in, and repeated, should the first application prove ineffectual. Should it resist this, it may be easily overcome by the use of wooden clamps

like those used in castration. The greatest care must be taken to return all the contents of the sac into the abdomen, the horse being turned upon its back if necessary, and the clamps, having been applied over the skin close up to the opening, are to be drawn as tightly as possible with strong pincers, and then tied with a strong, well-twisted cord which will not yield. The object is to obliterate the sac, and the clamps should be left on until they drop off together with the imprisoned skin. The edges of the skin above will then be found to have united, and a closure of the wound to have been effected. During any form of treatment it is desirable to keep the patient on a spare and somewhat laxative diet.—*English Farmer*

CALOMEL FOR HOGS.—A correspondent of the *Southern Farmer* recommends calomel for disease of swine and we give his experience. Last fall I had a litter of eight choice pigs somewhat similarly attacked. They became scabby about the eyes and bones of the head, would eat nothing; purge, cough, dwindle—and all died in from one to three weeks after the attacks, although I used various remedies, none of which seemed to have any good effect. Soon after these all died, one pig of another litter was attacked, and as an experiment I gave it about fifteen grains of calomel, and it got well immediately, and none of the others became affected. This spring, the same sow which lost all her pigs last fall, had another litter, and when a few weeks old they began with the bad symptoms, and two died before I thought of the calomel. I gave it to four others affected, and all got well. From these experiments and their success, I deem their publication worth the attention of the farmers. I notice the same disease prevails amongst pigs in Ohio and other localities, and I have great faith in calomel as a remedy, be the disease what it may.

PATCHES AND LUMPS ON A COLT.—The treatment adapted to this attack is the following laxative drench, composed of raw linseed oil, twelve ounces; tartar emetic and calomel, of each thirty grains; mix thoroughly together; repeat this drench on the fourth day and stop. Give the following powder, morning and evening, in a mash, when the latter gets cold: Powdered carbonate of iron, calomel and tartar-emic, of each thirty grains; powdered gentian root, Jamaica ginger root, lobelia and lac-sulphur, of each one drachm. Mix well together and thoroughly through each mash. Feed plenty of carrots, potatoes, beets or turnips, but no heavy grain whatever. Put in each pail of drinking water: of powdered nitre one drachm and cream of tartar one dessert-spoonful. Wash over the diseased parts thoroughly three times a day with a solution composed of sulphuric acid, two ounces; cold water eight quarts.—*N. Y. World.*

The *Scientific Farmer* says:—"A subscriber at Orange, N. J., had a valuable cow taken with impaction of the rumen, because of a surreptitious visit to the meal chest. A cow leach was called in during the absence of the master, who called the affection 'tail all' and prescribed the removal of her caudal appendage. The deed was done, but no relief to the cow resulted. At this juncture the owner arrived on the ground, and, after forcibly ejecting the quack, proceeded to give injections and drenches of soap suds. This treatment soon produced the desired result, a speedy cure. Suit was afterward brought in court against the cow leach, and a judgment of fifty dollars obtained as the price of the cow's fly-whisk. The legal steps were all right, even from a scientific point of view. But we should advise a different drench: First, a strong purgative, such as a pound of Epsom salts in three pints of ale or gin and molasses; second, a mild antiseptic after one hour, as follows:

Liquid ammonia.....	1 oz.
Warm ale.....	1 qt.
Ginger.....	2 oz. (Clater).

"The injections were correct, and in such cases should be continued every half-hour until relief ensues."

MILKING A DRYING COW.—Colonel S. D. Harris, in the *Country Gentleman*, condemns the usual practice of farmers to leave a drying cow alone as soon as the milk shrinks so as not to fill the bag once a day or once in two days. He says: "The little milk which is secreted must be taken away, or it will work mischief in the organs of the udder too serious to be overlooked by the careful dairyman. It is one of the processes of nature that when matter of this kind is deposited (unless it be in large quantity) it must be soon removed, or it is reabsorbed into the system; and when matter is once perfected, as in the case of milk, it is no longer congenial to the system, and if not taken away it becomes a deleterious element for reabsorption, poisoning instead of feeding the animal. Thus, you will find in the udders of cows thus affected hard lumps near the base of the teats, which are caused by the solidification of putrid milk, left there in drying up the cow the season before, and the cow will never get over it; but when these organs encounter any difficulty in the season of flush milk this lump will be the nucleus of inflammation, just like a thief who is already secreted in a house, ready to help another who is to break in from the outside. To be free from all such troubles the cow should be carefully watched for weeks and months after the regular milking is stopped, and the teats tried to see if there is milk to be taken away. This operation should be performed at irregular intervals, so as not to invite a regular secretion of milk, until the milk vessels cease to lead anything in that direction."

REMOVING SAVAGE BULLS.—"For the removal of savage bulls," says a correspondent of the *London Agricultural Gazette*, "have a girl around behind the shoulders; but, in place of the rope being fastened to the ring, fasten it securely to one of the forelegs, just above the foot; then, when the bull attempts to run at the men that are leading him, the man behind pulls the rope and down comes the bull on his knees. I have seen one of the savagely tamed by bringing him a few times to his knees; and another advantage is, the pressure is not all on the ring."

SORE TEATS IN COWS.—Any dairyman troubled with cows having sore teats should use plenty of linseed oil before and after milking. He will find but little if any sores or cracks about his cows' teats if this is done. Many cows are kickers that would delight to be milked if a little linseed oil were used on the teats. I recommend a vial of it kept in every dairyman's stable. Sometimes teats appear smooth that are tender and only need a little oil to make the cow happy.—*Cor. Country Gentleman.*

A NEW EQUINE DISEASE AT CHICAGO.—A Chicago exchange says:—"The equines of this city are just now suffering from a disorder which is puzzling the powerful minds of the veterinary profession. Apparently only those animals which were epizootic patients have been attacked by this new disease. No one has been able to give a diagnosis of the disorder, but a Westside horse man calls it epizootic scald, which describes its most salient peculiarity. The diseased beasts, whenever over-heated, exude a peculiarly odorous perspiration, which scalds the hide and causes the hair to drop off, leaving a very tender sore in the flesh. One lively man is of the opinion that the poisonous virus left from the epizootic is carried to the surface by the unusual discharge of perspiration, and that external sores and excessive irritation are the results. It is estimated that several hundred equines are now temporarily laid up by this new and incomprehensible disorder."

WORMS IN THE RESPIRATORY ORGANS.—The round thread-like worms that infest the respiratory organs of calves and lambs appear yearly to extend their annoying attacks. The *North British Agriculturist* says:—"The embryo forms of many of these parasites are very tenacious of life, and appear to retain vitality for many weeks, or even months, until they find a suitable lodgment in which they can flourish. The thread worms are always most destructive to young and indifferently reared animals, and thousands of calves and lambs pine, cough and die from their attacks. Most cases occur on old grass, well sheltered by plantations or lofty hedge-rows, not too closely cropped down and grazed during the early part of the season, or perhaps also in former years with young stock. On grass grown on the rotation, especially during the first year, there is comparative immunity from these attacks, merely because there has been no nidus for the embryo worms. Of course calves and lambs do suffer when grazing on such one-year-old grass, but only if they have previously picked up the parasites from other situations. How long they are carried in the system before they are matured and begin to cause serious irritation is not yet known. To destroy them is not difficult, provided proper means are taken before irritation has seriously weakened the restless choking patient. The inhalation of the fumes of burning sulphur or of chlorine is very effectual, care being taken not to suffocate both calves and worms. The most handy effectual remedy for calves is about an ounce of turpentine given fasting by the mouth in linseed oil, lime water, or milk, and repeated every second morning for a week. By cake, corn, good hay, and other nutritive fare, the calf must be meanwhile be well nourished."

STOMACH STAGGERS.—Stomach staggers in all animals is accompanied by more or less overloading of the stomach with indigestible food. In cattle the first and usually also the third stomach are overfilled, their functions are paralyzed, perversion of the duties of the brain and other nervous centres ensues. The excessive nervous prostration, the coma or frenzy which often characterize these cases of stomach derangement, may perhaps be better understood when it is remembered what dreadful headaches are sometimes produced in ourselves by attacks of indigestion. It is the intimate nervous connection which subsists between the brain and the digestive organs which causes them thus to sympathize, as it were, in each other's troubles. There should be no serious difficulty in preventing a simple disease like stomach staggers. All that is necessary is to keep the animals from gorging on the coarse fibrous fermentable or other indigestible food. At this season of the year the most common offending substances are ripe ryegrass, or old, fibrous clover, or vetches, to which most animals are partial, which are eaten freely, but being tough and hard, resist the solution of the gastric secretions and accumulate in some portion of the digestive tract, causing mechanical obstruction, and by and by inducing irritation and inflammation of the mucous textures. Insufficient water during a dry period like the present proves also a prolific source of stomach staggers. When the food, as now, is dry, an extra amount of mixture is obviously requisite for its normal maceration and digestion. Professor Williams and some other good authorities consider that stomach staggers originate in the brain and nervous centres, and that the gastric derangement is established subsequently; but all are agreed as to the disorder alike in horses, cattle, and sheep, being produced by dry fibrous food, and at this season of the year especially by the ripened seeds of the grasses.—*North British Agriculturist.*

The Poultry Yard.

Watch Your Sitting Hens.

If eggs are broken in the nests take the hen carefully off and wash the eggs in tepid water, then take the straw out and put it in fresh, and place the eggs under her again. Should the hen leave the nest for any cause, and the eggs become cold, do not throw them away, even if the hen has been off twenty-four or more hours. Get a pan or pail of water heated to 105° Fahrenheit, and immerse the eggs. Leave them in until they are warmed through, perhaps half an hour, adding more warm water if necessary, then place them under a fresh hen. In the latter stages of incubation, after the egg has passed the fourteenth day, they have been saved and hatched after having been deserted for over forty-eight hours. Keep memorandum of all hens set, with dates, when they should come off, that you may have coops and proper food prepared for them. Also take the young chickens from the hen as they cry, because sometimes they may run over their time a little, or hatch earlier.

Cooked Feed for Hens.

A writer states in the *Poultry Standard* that people would better understand this matter if they considered for a moment a hen to be, as she is, a small steam engine with an egg-laying attachment, and that there must be a constant supply of feed and pure water to keep the engine and its attachment up to its work. In addition to keeping before hens that have complete liberty a constant supply of pure water, summer and winter, I have found during the cool and cold weather of fall, winter and spring, a dough compounded as follows, fed one day and then intermitted for two days, to produce excellent results: "To three gallons of boiling water add one half an ounce of common salt, a teaspoonful of cayenne pepper and four ounces of lard. Stir the mixture until the pepper has imparted considerable of its strength to the water. Meantime the salt will have been dissolved and the lard melted. Then, while yet boiling hot, stir in a meal made of oats and corn ground together in equal proportions until a thick mush is formed. Before feeding, taste to see that you have an overdose neither of salt nor pepper and to prevent the hens being imposed upon with a mixture not fit to be eaten, nor so hot with pepper that you could not swallow it.

Artificial Hatching.

In a recent number of the *CANADA FARMER*, we illustrated and described a simple arrangement for the artificial hatching of chickens. The following additional article from a correspondent of the *Country Gentleman* may serve to farther simplify the subject:—

There having been many inquiries, within the last few years, for the most approved methods of hatching and rearing chickens, without the assistance of the hen, and without too great expense, I send the enclosed sketches of hatching box and artificial mother in use in France, and invented by M. Carbonnier. The construction and operation of both are so simple that I believe almost any one of ordinary ingenuity can make and use them successfully. Fig. 1. represents the incubator, with the drawer, containing the eggs, partly drawn out. Fig. 2. shows a section of the same. The upper part of the box contains a zinc reservoir, with a space left, as shown in the drawing, for the introduction of the lamp, and a small tube passing through the top of the box, which serves for filling it with water, and also for holding a thermometer, which, plunged into the water below, indicates the temperature. Thermometer tubes may be obtained, and held in position continually by inserting through a perforated cork of the proper size; the temperature of the water may then be seen at a glance. The drawer for the eggs is immediately beneath the reservoir; it is provided with two small holes for ventilation, and holds about forty eggs. A small thermometer is also kept in the drawer to indicate the temperature of the air surrounding the eggs. A space is left around the reservoir, and on three sides of the drawer for a filling of sawdust or other non-conducting material. A flat tin lamp, with two round wicks, is used by the inventor, but I see no reason why one properly constructed kerosene burner would not answer the purpose. A little soft hay is spread in the bottom of the drawer; the eggs are put in; it is then closed and warmed by the water above. The temperature of the water is kept at 122°, or enough higher or lower to keep the eggs at 104° to 106°. Once or twice each day the drawer is opened, and the eggs turned and left for a quarter of an hour in the open air before replacing. At the end of 21 days, the chickens come out of the shell without assistance, and are left 24 hours in the drawers, without feed, before being taken to the artificial mother. This operation follows the natural method exactly; the eggs receive their heat from above;

they are turned each day, and are ventilated, as in the case when under the mother. The holes for ventilation in the drawer are very small, and probably could be dispensed with without inconvenience, as few will make the drawer fit air-tight.

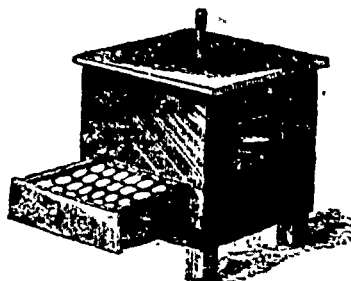


Fig. 1.

The artificial mother represented in figs. 3 and 4, is also provided with a zinc reservoir of the shape shown in fig. 4, it is covered below with a lamb's skin, in the warmed wool of which the chickens nestle and warm themselves. This reservoir is only filled in cold weather, and then only once a day, the water being first brought to a temperature of 160° to 175°. The tube passing up from this reservoir is used for filling and the one at the side for

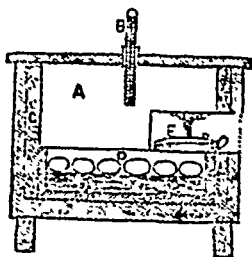


Fig. 2.—A. Zinc case for water—B. Thermometer—C. Non-conducting filling—D. Drawer, with eggs—E. Lamp.

emptying. The top of the box is of glass, arranged to slide so as to open at pleasure; there are three ventilating holes on each side, and a gate at the end. The chickens are placed in this when twenty-four hours old, and kept there for a week; they are then gradually habituated to the outside air—the gate being constantly open for them to enter at will. Fresh water and feed are given five times each day, it being considered essential to give only small rations, and to repeat them frequently.

This method of hatching and rearing chickens, which follows nature so closely, is used to a considerable extent in France, and is evidently satisfactory. Its economy in

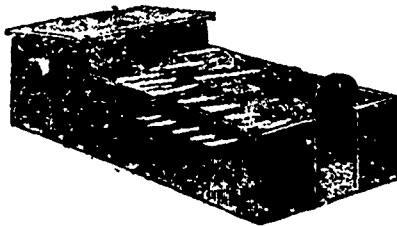


Fig. 3.

this country depends almost entirely on location. With oil at 13c. to 15c. per gallon, eggs could probably be hatched for about 1c. each. There is no trouble with hens leaving their nests, or losing their chickens with poor care; and with the non sitting breeds the eggs laid during the period of incubation would pay double the cost of hatching a sitting. This of course only applies where eggs are worth 1c. or 2c. each, and a considerable number of chickens are raised. There can be no doubt that in such cases artificial hatching and rearing would pay well if properly conducted. The method of hatching by means of fermenting horse-manure, advocated by Prof. Corbett, I have never

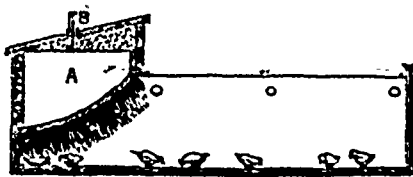


Fig. 4.—A. Zinc case for water—B. Tube for filling—C. Lamb's skin.

seen in operation, but for very large establishments the plan, or some modification of it, might be found advantageous. On a smaller scale, however, and for all who wish for any reason to hatch artificially with little trouble and expense, I have never seen anything that would compare with the apparatus just described. For hatching high-priced eggs, such as are frequently sold at from 30c. to 50c. each, it would almost invariably pay.

The Apiary.

How Shall I Begin?

A beehive in a garden is an object of general interest, and many who know little or nothing of the natural history of its inhabitants find peculiar pleasure in watching the unwearied activity and industry with which they pursue their labours on a bright summer day. The gratification derived from this source is alone deemed sufficient reward for keeping bees in a district where the honey harvest is insignificant, and colonies can only be preserved in existence by careful feeding in autumn and spring. We have heard some people living in the midst of bleak and barren lands, so far as flowers are concerned, say "Our bees never yield us any return, but we would not want them on any account." The majority, however, who have set up an apiary, aim at combining profit with pleasure, and in this country there are very few localities in which bee-keeping may not be cultivated with advantage. Where heath or clover or orchards are found, there too will be found at an earlier or later period of the year abundance of honey. What is chiefly needed is fine sunny weather at the time those particular flowers are getting into full blow on which a hive's welfare depends. This time in some places happens to be in May or June, and in others in July or August. But certain neighbourhoods are well supplied with flowers during all the summer months. A bright and warm fortnight, however, in any part, when harvest proper commences, will enable a good swarm to fill its hive with comb and honey, or a populous stock to complete a 20 lb. super.

But what prevents many people from possessing themselves of a hive is their supposed ignorance and inability to manage it. One gentleman about to remove to a residence in the midst of "clover, sainfoin," &c., writes to us, "I propose to get bees," and pertinently asks, "how shall I begin?" Others may be similarly situated, and for this and their benefit we shall endeavour to answer the question.

Virgil says the first thing to be done is to look out a proper station with the bees, but with Meg Dolls, or some cooking celebrity, who recommends catching the hare before proceeding to skin it, we advise you, on the supposition that you have some kind of station for them, good or bad, first to procure your bees. This is one of the best of years for getting an eligible hive, and August and September are both good months for making a good selection. Every hive in our apiary is at the present moment overflowing with honey—and has enough, and more than enough to support it through the coming winter, and as the season everywhere has been favourable to bees a hive might be chosen at random with the moral certainty of being full of honey. But to remove all doubt on the subject, the purchaser, if he cannot examine it, must judge of its weight by lifting it. The weight of a good skep, minus the floor-board, should be, during the month of August, about 3 stones. At the end of October it should not be much under two stones. When these conditions exist no feeding will be required, unless the following spring happens to be very late.

A purchaser ignorant of apian matters, and unable to form an opinion of the amount of store in his selected hive by poising it in his arms, may apply a spring balance, or take an assurance from the seller that it is both well supplied, and in good condition, i. e., free from disease.

It ought to possess also a fertile queen—and the probability that it does, in the absence of inspection—may be inferred from the circumstance of the drones, or male bees, having been all killed, or in process of being ejected and killed, and the working bees carrying in pollen upon their legs. The drones are much larger than the labourers, and generally are expelled (by the labourers dragging them out of the hives) before the end of August.

Numbers are often seen lying dead in front of a hive that has completed its work of carnage. If the ground there be strewed with these slain fellows, who have spent their two months' existence in idleness and sloth—or if, in standing near the hive, two bees are noticed on each side of a drone, hauling him out and tumbling him over the landing board—it is a good sign of a fertile queen being present.

Drones are seldom ejected or killed by bees which have lost their queen and have no material to supply her place. Their existence at a late period of the season is an indication of misfortune and disaster. A flourishing and healthy stock banishes its drones early—sometimes before the end of July.

Then, again, if bees are seen carrying in pollen, it is an evidence of their having broody combs, and a presumption in favour of maternal duties being performed.

Bees carry pellets upon their legs as long as they have brood to rear, but in two or three weeks after the disappearance of a queen no brood remains, and farina is no longer collected. An exception to this is when bees have the means from which another queen may be reared, and proceed to use them. In that case there is no interruption to pollen-gathering. But a late-bred queen, from the temperature getting low, or no drones surviving, is frequently worthless and produces no workers.—*Agricultural Gazette*.

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

CANVASSING AGENTS WANTED.—First-class men, of good address, steady, and pushing, to canvass for the WEEKLY GLOBE AND CANADA FARMER. Address, stating employment, previous engagements, age and references, Publishers of the WEEKLY GLOBE AND CANADA FARMER, Toronto.

The Canada Farmer

TORONTO, CANADA, OCTOBER 15, 1876.

Adulterated Butter.

The adulteration of butter has been brought to such a high state of perfection that there now seems good ground to doubt the reliability of all known methods of its analysis. A case in point very recently occurred in Glasgow. One of the city sanitary inspectors purchased from a provision dealer, named McKinnon, a pound of butter which had previously been bought from a wholesale house, and on the recommendation of a chemist who pronounced it pure and of good odour. The inspector however submitted the sample to Dr. Clark, city analyst, who condemned it as not genuine. Thereupon an action was entered against the dealer who, in defence, submitted the testimony of two other chemical authorities, confirming that of the chemist who had first recommended it. Sheriff Lees who tried the case, sent the article for further inspection to Somerset House, whence he received the following report, on the strength of which judgment was given for the plaintiff and a fine of two guineas imposed upon the defendant.

"The samples of butter referred to in the preceding letter was received here on August 2, 1876. It was enclosed in a wrapper marked 218 B and 21, 31st July, 1876, and was securely sealed. We herewith certify that we have analysed the butter, and declare the results of our analysis to be as follows—

Water	14.30	per cent
Curd and impurities	60.45	"
Salt	3.81	"
Fats	21.41	"
	\$100.00	"

"From our examinations of the fats, we are of opinion that the sample is made up almost exclusively of a fat which is not of butter, and which has apparently been worked up with a little milk."

Accompanying the report was a letter signed by Mr. Bell, one of the analysts, and containing amongst others the following remarks:

"I may state that I think we have fairly investigated the butter question, that the investigation was undertaken in the interests of both the trade and the public, and that we had hoped the results would prove satisfactory to both. In the present case it is clearly of importance to all parties to have an uninterested opinion on the true character of an article which, it appears, is being imported from Holland and sold under the name of butter."

Mr. Bell was evidently not aware of Hollanders nearer home. The Glasgow News, reviewing the case, and commenting pretty severely on the decision which, it contends, should have been directed rather against the manufacturers than the dealers, proceeds with the following piece of enlightenment:—Messrs. James Smith and Sons, soap-makers and oil merchants, 20, Ropeworklane, Glasgow, have works at Kyle-street, Port-Dundas, and Ruby-street, Dalmarock-road. Up to a few weeks ago the Port-Dundas establishment was exclusively, or almost exclusively, a place for the manufacture of soap. Since then the requisite machinery has been constructed, and at the present time it is devoted entirely to the manufacture of butter. The process of manipulation is as follows:—Good beef suet, perfectly wholesome, is sorted, and every piece of coarse texture is separated from it. Having been roughly chopped up by hand, the suet is placed in a machine heated by steam, in which it is torn, by rapidly revolving knives, into the smallest particles. The heat of the machine brings it to a melting point, and it flows into a receptacle, where it undergoes constant agitation for about two hours. The object of this is to remove from the fat the grosser substances, such as the filaments or shreds of skin which may be attached to the suet. These, with other impurities, fall with the heavier fat to the bottom. Having been allowed to settle a tapsituated some inches above the bottom of the machine is opened, and a fine, rich oil flows into cans prepared to receive it. It is allowed to cool to a butter-like consistency, and is then placed between mats, and

subjected to the squeezing of a hydraulic press. This has the effect of straining the fat through the mats, again leaving the grosser particles behind. The fat is taken to zinc vats, and once more heated. Drawn off in a liquid form, it again undergoes the straining process in the hydraulic press. It is then supposed to have been reduced to a state of purity, and ready for amalgamation with milk. This is effected in a gigantic churn, fitted up with two sets of paddles. The proportion of milk and oil may be roughly stated at about 11 gallons of the first to 30 or 33 gallons of beet fat. The mixture is thoroughly amalgamated by the constant and rapid motion of the paddles, which also have, of course, the effect of producing the usual proportion of new, fresh butter from the milk. It is necessary after this to drive out the whey which has formed, and to do this the substance is passed through rollers, which not only expel the water, but make the amalgamation more perfect. From this it is conveyed to kneading troughs, where it is worked by hand, and receives its due proportion of salt saltpetre, and colouring matter. Nothing more remains than to pack it into tubs usually associated with particular markets of fine butter, and issue it to the trade with any particular brand that may have been determined upon, for sale to the community, as "Fine Jersey," or any other class of good, saleable butter.

Through the indomitable energy of the same journal, the whole subject of adulteration has now been pretty freely ventilated across the Atlantic, and legislation upon it at no distant day is highly probable.

Dynamite for Stumps.

The question is frequently asked: Is dynamite profitable for eradicating stumps? We have no hesitation in replying that the results of its application in this respect are not nearly so great as was at one time claimed or expected. In a recent issue of the New York Herald we read as follows regarding an experiment which, in one case at least, seemed a success: "Some dynamite was employed to raise stumps from their position and hold in the earth. A quantity of earth was removed from the side of a stump and a hole driven below the stump with a crowbar. Into this hole a cartridge of dynamite was pressed by means of a wooden ramrod, then a detonating percussion cap, with a Blackford's fuse attached, was squeezed into a small cartridge or primer of dynamite and inserted into the hole in contact with the charge. The hole was filled up with loose earth, about a foot length of the fuse being left bare. A match was next applied to the fuse and a sufficient time was taken for the powder to reach the percussion cap to allow the operatives to retire to a safe distance. When the explosion occurred the stump was literally blown out of the ground, some of the fragments, weighing nearly twenty pounds, being thrown a distance of over 100 yards."

Now, in this case, there were no doubt some exceptional circumstances, possibly overlooked, which rendered the shattering comparatively easy. We have seen dynamite repeatedly applied for similar purposes, but, in nine cases out of ten, the only effect was the tearing away or loosening of but a very small portion of the stump, so that the charge had to be repeated again and again—in some instances as often as twenty times to an ordinarily sized stump. We quite agree with the Herald however in recommending dynamite for blasting boulders.

Agricultural Fairs.

The principal fall exhibitions are now nearly over, and we trust the practical lessons they are designed to teach will not be lost. It is gratifying to notice that, as a rule, these shows are vastly improving from year to year, if not always in the quantity, at least in the quality of the products exhibited; and it is further noticeable that this improvement is intrinsically greater or less just in proportion as practical farmers themselves take or do not take the regulation and direction of matters into their own hands. When the directors of agricultural societies used to be for the most part citizens and townsmen engaged in mercantile and other kindred pursuits, of course the success or non-success of exhibitions hinged largely, in their estimation, on the magnitude of the crowd attracted. Business was in their eye, and the amount of business transacted decided the merit of the show. As an incentive, therefore, to this consummation, every kind of attraction used to be

thrown out—horse-racing, gambling, anything to draw the multitude, in order that the multitude might enliven business by spending money. Tavern-keepers in those days were the most active promoters of exhibitions, particularly the side issues, for they reaped from them the largest harvest. Happily we have now entered upon another and a different era, when the success of exhibitions is adjudged wholly on the merits of the display when they have realized largely their original and proper aim—an index of the present and a stimulus to future prosperity. The local cattle show, says one of our English exchanges, is an important institution, stimulating the breeders of the district to improve their stock, each in gentle rivalry trying to outvie his neighbor. It is at the cattle show, when his horse, cow, pig, or sheep stands alongside his brother farmer's animals, that he finds out the failings and virtues of his own stock, and then goes homewards with a determination to go on improving its type and general character. Though, perhaps, beaten, he is not quite vanquished while he lives to fight another day.

To the healthy influence of competition at cattle shows we must greatly attribute the present fine, improved character of our flocks and herds. In the exhibited animals the breeder sees what points to avoid or to cultivate. If he determines on making a mark himself, he does not fail to procure the blood of some winning strains. He cannot well do it without. Other laborers, however, have been in the field, and he enters upon their harvest. It would be folly to attempt to perfect an old unpedigreed strain of Short-horns, while the work is already to hand in a far advanced stage, from which the breeder may at once take his starting point without loss of time. It is this consideration which puts a somewhat fictitious value, apparently, on the strains of cattle, horses, and sheep, which have made special character and the power of transmitting their best qualities to their descendants. It is not the value of the individual animal as a food producer or as a breeder of ordinary stock for sale to the grazer or butcher, but its potentiality for good for generations to come that makes it a much coveted prize. The many years of skill and science also spent in developing the strain, the costly experience gained in the face of many difficulties, all go to render highly-bred animals valuable. Were it otherwise, fancy prices would be ridiculous. The cost of producing stock is necessarily included in their market price—following a common law of commerce. Thus prices that sometimes appear sensational are frequently but a natural result of time and treasure sunk in forming the special type which, if broken, it would take a generation to repair.

To all, and especially to the farmer, these exhibitions of stock and farm implements are educational. It is therefore satisfactory to find them ever increasing in popularity. The influence they exert on modern agriculture must be great. They are deserving of every support, and we trust the present show season will be as pleasant and successful as that of any previous year.

Trade with England.

We have on several occasions noted in these columns the gratifying trade that has sprung up, and is being speedily established between Canada and Great Britain in the matter of horses and cattle. The profits of exporting have been quite large enough to encourage a wider extension of the enterprise, and stimulate to greater activity in the development of these branches of Canadian farming. In addition to the trade in live cattle and horses, we have now to chronicle the creation of another branch of business with our kinsmen over the sea. "The latest instance of Canadian enterprise," says the Liverpool Daily Courier, "is the exportation of eggs by D. D. Wilson, of Seaforth, Ontario. These eggs have found their way to Liverpool and Glasgow, and notwithstanding their journey of over 4,000 miles in the hottest season of the year, have preserved their freshness in a remarkable manner. Mr. A. G. McDougall, of Seaforth, Ont., who is now on a visit to this country, and to whom the eggs were consigned, is so pleased with the satisfactory issue of this new venture that he has made arrangements to furnish supplies of eggs to this country on an extensive scale. Considering the scarcity of eggs here particularly during the winter season, the importation of Canadian eggs will doubtless be hailed with satisfaction."

California Wheat Rings.

The wheat-ring system of California has been reduced to a science. Practically, the entire export and carrying trade in grain is monopolized by a select few who, already fat with the profits of their own investments, have recently invented a plan of operations by which their coffers are equally well replenished without the risk of a single dollar. They are now, in fact, operating on the capital of those they have already fleeced, the farmers. They are loading ships with wheat and dispatching them for the European markets without having a dollar of their own money invested in that wheat, and by this same operation are completely destroying all demand for wheat for export at any price. And the strangest part of this transaction is, that they have got the farmers to become parties to and promoters of the whole scheme, notwithstanding it is all done at their expense and to their great disadvantage. The operation is this: The grain buyers, through their agencies, which are located in all the wheat-growing sections of the State, ascertain as nearly as may be, the amount of wheat to be exported. They then get control of the necessary shipping to carry this wheat to market. They then fix upon a price for wheat alongside the vessels, which, of course, is low as compared to the European market price. This price they cause to be quoted in all the commercial papers of the Bay City, and the same is copied into all the local papers of the State. In connection with this quotation, however, they manage to have it stated in all cases that there is little or no demand. They then instruct their agents throughout the country to keep and represent wheat as dull and not wanted at any price—that is, they are not wanting to buy. For the accommodation of farmers, however, who have not the means of storing all their wheat, they will take all the wheat that may be offered—that is, they will borrow it of the farmers, and will agree that within a certain stipulated time they will, on demand, return an equal amount of wheat, or will pay for the same the then market price, at the option of the loaner, the farmer. Thus the wheat buyers, all of whom are combined and interested in the operation, are managing to get possession of large quantities of wheat without the investment of a dollar of their own money, and with it to fill their orders and supply the European demand, while the farmers in their ignorance and innocence work on and wait for wheat to rise so they may demand a return of their loaned wheat or its equivalent in gold. And so they may work and wait in vain, for what is there to produce a rise of wheat under the circumstances? The real demand for export has been supplied, and the ring of wheat buyers, with the money in their pockets, are masters of the situation. They don't want to buy wheat, and there are no other buyers. They already have the farmers' wheat, and the money for it, and of course wheat will remain dull and the prices rule low. The wheat ring will not be in any hurry to part with the money they have obtained in this way, nor will they be anxious to put up the price of wheat, but the time will come when the farmers will be under the necessity of realizing something for their crop to pay expenses and debts, and just about that time wheat will be mysteriously very dull and low, and then the ring will profess to have plenty of wheat, and will be anxious to return all they borrowed. As a compromise however, and to get out of the scrape they have got into, they will give the farmers the money at present rates, and just to accommodate them, though they do this at a sacrifice.

Dairying in America.—An English Opinion.

A couple of weeks ago we had the pleasure of a call from Mr. John Oliver, the English dairyman, whose name is not unfamiliar to the readers of the CANADA FARMER. Mr. Oliver has now spent some four months in New York State, and Ontario, has visited some of the best factories and compared notes with the leading owners and manufacturers. His object in visiting this country was the introduction of the Cheddar system of cheese-making, which he has already described in a condensed form in articles contributed to the May and June issues of our paper. In the course of a conversation with him, we learnt that in his opinion the great majority of the buildings now in use for the manufacture of cheese and butter, are constructed on wrong principles, and in many cases without any re-

gard being paid to the convenience of the maker, and that until the evil is remedied by the erection of factories and creameries on practically scientific principles, perfection in the manufacture of dairy goods will not be reached. In the making rooms he found in some cases a great quantity of waste space; this was travelled over and cleaned daily, adding not only to the labor, but also to the cost of the building; in others the maker and his employees were awkwardly situated from want of working room. The floors were often badly laid, in many cases the boiler was in the making room and within a few feet of the vats. In some instances, however, the energetic owner had endeavored to arrange his building as perfectly and conveniently as possible, though such instances were few. The curing rooms, he said, were seldom fit to cure cheese in, the walls boarded on the outside only, were not sufficient protection against either the heat of July or the cold of November; the windows in most instances were needing outside shutters to cover them from the hot glare of the mid-day sun; and he found the temperature as indicated by their own thermometers during the warm weather to be about 90° Fah., when in spite of the severe heat of the past summer it need not have risen above 70°. It is not surprising, he thinks, that it is more difficult to turn out fine-flavored cheese in summer than in autumn. It would be unreasonable to expect any cheese to pass through such an ordeal as three weeks at 90°, and come out uninjured. He found a few factories where with double walls, venetian shutters to the windows, and the habit of opening the latter during the night, and closing them by day, a far lower, and more equable temperature was obtained than is generally the case. There is not a point more important than the control of the temperature in both manufacturing and curing rooms, and none more constantly neglected by owners and cheese-makers.

Through the energy of various furnishing firms, dairymen have been enabled to provide themselves with valuable implements and fittings, among which may be mentioned the Fraser press, which he (Mr. Oliver) found in use in many factories, and with them as an almost invariable consequence well-pressed, shapely cheese. The curd mill by Messrs. Jones & Falkner, of Utica, N. Y., the Blanchard churn, and the Cunningham butter worker, are in his opinion, the best yet in use in the classes to which they belong. The surroundings of some factories, he said, were most objectionable, the whey tanks located near the buildings, and open to the air, that every breeze might waft the noxious perfume into the factory, where, with open windows, the night's milk lay cooling. The drains by which the liquid refuse of the making room flowed away were also open, and rendered the whey tanks all possible aid in imparting to the milk that taint of which we have all heard so much. In almost every Dairymen's Convention, a discussion has been held for the purpose of discovering a system by which tainted milk may be made into good cheese. Yet the evil still exists, and "summer" cheese is the constant vexation of both maker and buyer. What is needed, Mr. Oliver thinks, is that factory men should remove stinking whey vats, and open drains, rendering the surroundings all that could be desired in point of cleanliness and freedom from all objectionable odours; and that the farmers should feed their cattle on wholesome food and spring water, instead of allowing them to graze in fields which are little better than swamps, where the grass is hard and reedy, and the water stagnant and poisonous. He suggests that in view of the old "floating curd" discussions, the Dairymen's Association should at its next meeting spend all the time it can spare in finding out the best and quickest way to get rid of the evil; and that next year the rarity of floating curds may show with what vigor the necessary changes have been effected. "Strange" Mr. Oliver continues, "that the truth of the old proverb 'prevention is better than cure' should never have occurred to those who are so intimately connected with the dairy interest, when the vexed question has been the subject of lengthy speeches by the authorities, followed by protracted debates, of the earnestness of which we may judge from the reports with which we are favored by the Association and the agricultural press." He says to the farmer, in place of swamp grass, and stagnant water, he would recommend that the land be cultivated and the soiling system adopted. The wisdom of such a course would soon be proved by the increased quantity of milk, with its pleasant accompaniment of an

addition to the farmer's income; while the dairymen could rejoice in the purity of the material now received without a dread of "floaters," which, up to the present, have been so common during the "hot spells" of the American summer. There are of course circumstances as yet beyond the control of both farmer and maker, but leaving this out of the question, great improvements may be effected by doing at once what may now be done."

But true to the system he advocates, and the object of his visit, Mr. Oliver assured us that, satisfied as he was, that by the American style of manufacture a keeping quality of cheese cannot be produced; that the Cheddar system will, taking the lead, soon prove its superiority, and its adoption be only a question of time; he is now, after having travelled among our factories with so good an opportunity of deciding upon the value of his opinions, more thoroughly convinced than ever of their correctness. Well aware that, in introducing his system, he will encounter the same prejudice and conservatism which have opposed the march of science in all ages; that every disadvantage, real or imaginary, which may seem to attach itself to that system, will be sought out and argued against its adoption; and that many untoward circumstances will for a time impede its movements and prevent its gaining the full confidence of the dairy interest; he does not intend to leave the field to opponents and doubters, but will continue to urge the introduction of the system which has achieved such great results in Britain. The objection which has, we understand, been generally raised, viz.: that the difference between the climate of England and America does and will prevent dairymen on this side of the Atlantic from producing as fine goods as the English makers, Mr. Oliver believes to be altogether unfounded. "Although they may not," he says, "enjoy the coolness of the English summer in the city or on the farm, I am perfectly satisfied that they may do so in the curing room, by constructing it upon principles which both common sense and science lay down as correct. But this change alone will not be sufficient, for the American makers in England have failed to make a keeping quality of goods, although they have the advantage of the much coveted cool summer weather." Consequently in answer to the question "How can we produce fine-flavored, keeping cheese?" he says "Adopt the Cheddar system."

Speaking of the desire evinced by the majority of makers to show as large a yield of curd in proportion to the quantity of milk as possible, Mr. Oliver said "I have come to the conclusion, from what I have seen and heard among English and American dairymen, that at the present time, with the appliances now in use, we cannot produce from the same quantity of milk a very large quantity of cheese, and that of a very fine quality. That we shall do so at some future period, I have no doubt. I have found that those makers who boasted of their large yield of curd had almost invariably goods lacking uniformity, and of a second rate quality."

On enquiring what he thought of the Canadian share of the Centennial dairy display, Mr. Oliver replied, "The honors won by the Canadian cheese at Philadelphia do not reflect as much credit on the makers as if the American dairymen had entered thoroughly into the competition. Neither the dairy commissioners nor the management of the exhibits were popular with the leading dairymen of the United States, consequently but few of them entered their goods for exhibition."

The Policy of the Season.

It is pretty evident now that the wheat crop of the year will not realize a fortune for the farmer. His profits for this season must be looked for in some other directions, and mainly, we think, in that of feeding his coarser grains and converting them into marketable beef, pork, mutton, lard and tallow, all of which will be sure to command good prices if they are of the right stamp. The hay crop is very large, sufficiently so to supplement most other stock-feeding deficiencies, so that, upon the whole, the opportunities afforded in this special line are above average. The fall months, particularly September and October, are eminently feeding months, the time destined by nature for laying in a stock of fatty matter to keep up animal heat during winter. If only attended to in time, an increase of live weight may be more easily made now than at any other period. Let the cattle not roam about too much in bare pastures. A saving of food at a sacrifice of flesh is a dead loss. Let there be no falling off now, and the winter will have been half provided for by the end of November. A gallon of mill feed in October is worth a gallon and a half at Christmas. Fat stock can be much more easily carried to the first of April than lean stock to the beginning of January. This is a fact well known to all experienced feeders. Let everything that can be turned into pork, beef or mutton be carefully handled and made to go as far as possible, and, above all, secure the right class of stock—thoroughbred or high-crossed animals—which are by far the most profitable from every point of view.

Notes from "Sarawak"

EDITOR CANADA FARMER:—Now that the harvest in this township is nearly over, and the threshing machines have commenced their annual rounds, I am in a position to give some account of the crops in this part of the county, and, I am sorry to say, that the account will be much less favorable than was anticipated two months ago, owing to the rust and midge, both of which are very prevalent, except along the bay shore, where the crops are not effected to so great an extent as they are in the rear concessions. In some places even the oats are affected by rust, especially when they were late sown. We have had the midge in our wheat for some years, but never so bad as this year, owing, I suppose, to the warm, moist weather which is peculiarly favourable to the midge. I have lately been informed that the Hessian fly has appeared in North Keppal, and in the neighborhood of Wiarton, and I suppose we may look out for another invasion of this dreaded pest, which committed such extensive ravages in the wheat crops in Ontario, Quebec and the United States only about thirty years ago. Farmers will need to look out for the most flinty stemmed varieties of wheat they can find, as it is doubtful whether any of our present varieties of wheat will be able to withstand the ravages of this unwelcome visitor. This seems to be a very bad insect year. The cabbage butterflies have made their appearance here for the first time. Unfortunately, the cabbages being planted at some distance from the house, we did not notice their presence soon enough to prevent their commencing their destructive work. I tried the effect of salt on the cabbages, but it has had none. The potato bugs have been on hand as usual, but a single use of Paris green, together with the moist showery weather, which promoted a rapid growth of the tops, has prevented them doing any serious injury. Of grasshoppers we have had none worth speaking of, although they have been destructive in other places. I have threshed 26 bushels spring wheat to the acre; one of my neighbors has about the same; another reports 51 bushels of oats to the acre; others expect about 5 bushels spring wheat to the acre; and I have been informed that in the southern part of this county the wheat was frozen in July, and in other places it was so badly affected by rust and midge that it was cut for fodder, not being worth threshing. I cannot report the yield of my oats, as, what I may require for seed next year, as well as some spring wheat, is not yet threshed, as I prefer threshing seed grain by hand. Pease are also a good crop. Along the bay shore, where we are not troubled with early frost, the late sown spring wheat has proved the best this year. It always escapes the midge better than the early sown, as it is not sufficiently far ahead for the midge to deposit its eggs until that insect pest has disappeared. It also had a better chance to fill, as the great heat of the summer was over. Smut has proved bad in some places, but I do not think the cause of smut is fully understood as yet. An old neighbor of mine, who has resided in different parts of the province, told me he once knew a farmer who always selected his seed wheat a year beforehand, and put it up in tight flour barrels with dry air-slacked lime, and he was never troubled with smut. A former resident of Owen Sound, who purchased the farm next mine some years ago, summer-fallowed a twenty-three acre field. The field was ploughed three times, the ridges well laid up, water furrows well cleared out, and seed sown about the 18th September. The seed he used was full of smut, and he was advised to steep it in pickle and lime it; but, having no faith in steeps, he refused. We had a fine fall that year. The wheat came up thick the next spring, and, by his own account, he threshed thirty bushels to the acre, and there was not a single head of smut in it. I have used blue stone, but I generally use salt pickle in lime; and, on the whole, I am inclined to think the best way to escape rust is to clean the ground well, keep the water furrows clear, and sow early. In England I have used sea water for steeping barley, and dried it with lime afterwards. About three years ago I procured some Scott wheat, and sowed that and Treadwell in a few fields. I found the Scott wheat stood the winter better, and was not so liable to rust as the Treadwell, but it shells out badly. This year, however, the Treadwell has proved the better sample. I have sown it again, as it seems to suit my soil better than the Scott wheat. We had less rain in this township in the

early part of summer than they had in most other places, so that the hay is not quite so heavy a crop as it might have been, but we have had frequent showers during and since harvest, so that the root crops, Swedes, sugar beet, carrots and parsnips are doing well. Some years ago I had a fair crop of sugar beets, and kept four pigs on them through the winter without any grain, only the leavings from the house. I prefer them to turnips for this purpose. I have repeatedly tried them since, but the seed failed to grow. This year I steeped the seed for several hours in warm water, and mixed dry sand with it to prevent them from sticking together. The carrot and parsnip seed I put into small boxes with some fine earth, and watered them every day for a few days, turning them over every day to keep them damp and hasten their germination, mixing a little wood-ashes with them previous to sowing, and they are growing well. The turnip beetle did more injury to some cabbages growing in the same field than to the turnips. It has been recommended in sowing turnips to sow every third or fourth drill much thicker than the others, as wherever the turnips are thickest the most flies will be found; this gives the other turnips a chance to get into the broad leaf, and there may still be enough left in the decoy drill, as it may be termed, for a crop, or, if they are Swedes, a few from the other rows may be transplanted to fill up vacancies. Probably my cabbages had the same effect, at any rate I shall feel disposed to try that plan again next year. Taken altogether, the prospects for the country next year are rather discouraging. With fall wheat a failure, spring wheat half a crop, barley the same, only hay, oats and pease good, and prices low, with no chance of much rise, unless in the event of the inevitable general war in Europe breaking out soon. The general panic, which was only avoided by timely rain last year, may be expected next year. The country villages and small towns are overcrowded with petty stores, most of which are probably supported by wholesale merchants as a means of disposing of their surplus stock; but I fear it will be difficult to make collections during the ensuing winter. In this section of the country rain was not so abundant in the early part of the summer as in most other places, so that the hay and straw were very short, and many farmers were under the necessity of raising money on mortgage, and now, what with generally deficient crops, and heavy interest charges, they will not have much left with which to purchase goods, especially as the school and township taxes must be paid. We have too many of those petty stores all over the country, and too many banks. If the weakest bank in the country should fail there would be a general panic and consequent run on the banks, worse than it was ten years ago, as there are more stores and more banks in the country now than there were then. Those farmers who have deposited their money in the banks would act more wisely if they employed it in underdraining their farms and purchasing artificial manures, and thereby increasing the arable produce of their farms, making up for the low prices, instead of leaving the money in the banks to be withdrawn at the first alarm, thereby increasing the danger, besides incurring the risk of loss. The manure heap is the farmer's best savings bank. As for the increasing cattle trade with England, only those farmers who have good grade cattle can take advantage of it, as it seems that only our best cattle will suit the English market; but I would suggest to the cattle dealers that whilst they ship off the No. 1 cattle alive, they should also buy up the No. 2 cattle and kill and pack them in barrels, as, when the general war does break out, there will be a great demand for salt beef for the English navy. Some years ago I saved a field of turnips from the grasshoppers by placing an old turkey with her young brood under a coop in the field, supplying her, of course, with food and water. The young turkeys fared well on the grasshoppers and always returned to the coop at night, and, by shifting the coop occasionally, the grasshoppers were soon cleared off and the crop saved. If a farmer had a good crop of turnips, and the grasshoppers were troublesome, it would be worth his while to buy a lot of young turkeys and turn them into his turnip field. On one occasion Mr. Coke, of Norfolk, England, had a fifty acre field of turnips infested with slugs. He bought up four hundred young ducks and turned them into his turnip field. They soon ate all the slugs, and even afterwards sold in the London market for more than they cost.

SARAWAK.

Judging at Shows.

EDITOR CANADA FARMER:—As the great bulk of our agricultural fairs is now over, no remarks of mine can possibly prejudice judges in judging, or competitors in offering their productions for judgment, at least for this season. It will not therefore be deemed imprudent in me to offer a few observations which, I feel sure, will find many a concurrent echo from every quarter of the province. My theme, introduced at once, is the abolition of judging and premiums in every department if we except that which comes more peculiarly under the care of the ladies. It is a notorious fact, not only here but in Great Britain, that old country which has attained nearer to perfection than any other, that judges do not give very general satisfaction. It is not that they are incompetent, nor yet that they show partiality designedly. On the contrary I believe that in the great majority of cases they render their decisions conscientiously and to the very best of their judgment. But after all, the divergence of popular opinion is so wide upon the same article, be it animate or inanimate, that that of one, or half a dozen, judges is getting to have but little weight attached to it. I have seen, during the present season a vast amount of indignation manifested over decisions rendered, and that not by the parties directly interested, the competitors, so much as among the general public, most of whom, coming fresh from the field of dear-bought experience, are much better qualified than even most judges to discuss the merits or defects of this, that or the other thing. Whenever, at such gatherings, I have found a knot of good, practical farmers favouring a certain man's seed, a certain implement, a sheep, pig, or other animal, &c., I have never failed to improve the occasion by purchasing in accordance with their views—and invariably with success—no matter how or what the delivery of the judges. Nay more, I have repeatedly known the objects of high judicial commendation prove practical failures. Indeed there is no surer guide or more reliable judge than popular opinion, and this is clearly manifested by the action of several exhibitors of late years, who have entered their exhibits labelled significantly "For exhibition only,—not for competition," thus resting their merits solely on the popular verdict which they adjudge favourable or the reverse, according to the number of orders taken on the ground. If it be urged in reply to all this that many persons, from practical ignorance of the objects under consideration, must depend on others for information, allow me to say that they cannot do better than consult their fellow agriculturists. And finally, since judging, in many cases, prejudices the public mind against articles that may be in themselves, and no doubt are, first-class, it should, I think, be done away with on that ground. The main aim and object of all exhibitors is business; shows to them are but huge advertisements. Let them therefore be regarded and treated as such—nothing more or less. The money prize rarely meets half the expense of exhibiting, and the "name of the thing" is in many cases a misnomer.

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Egremont.

Insect-Eating Birds.

[Continuation from last month of Mr. Palmer's Prize Essay, written for the Massachusetts Society for the Prevention of Cruelty to Animals].

Increase of Insects.

As a result of the decrease in the number of birds, we find that insects have been steadily increasing; and the aggregate loss through their agency is now much greater than in former years. Since 1860, the damage done each year by such insects as the canker-worm, currant-worm, wheat-midge, Hessian-fly, etc., has been greater and greater, so that in some sections, the cultivation of particular crops has been almost abandoned. New species of noxious insects are constantly being discovered by entomologists and others; while many species before unknown in this country have been introduced by the importation of plants, etc., from Europe. Insects that are abundant in the West are gradually working eastward, as the Colorado potato beetle; and only earnest study and effort will prevent the continued increase of these pests of the land.

There are about thirty species of insects which subsist on our garden vegetables. The grape-vine has about fifty insect enemies; the apple-tree seventy-five; our different

shade-trees some over a hundred; wheat and other grains fifty. The crop of wheat in the State of Illinois was injured by insects, in one year, to the estimated amount of seventy-three millions of dollars. The estimated annual destruction by insects in the United States is as high as four hundred million dollars. The effect of this loss is felt not alone by the farmer. It is to this, in a large measure, that many poor men owe their poverty; to this must be attributed the high price of farm-produce and all healthy food, and the consequent increase of disease and want in our large cities. We do not hesitate to say that at least one-eighth of this loss by insects might be prevented by the careful protection and encouragement of birds; or, to put it in another way, the carelessness of the people in the United States in this respect costs them at least fifty million dollars yearly, besides much unhappiness and suffering.

Tabular View of Food of Birds.

We must conclude, then, after careful examination of the habits of birds and insects, that birds are of the greatest service to man; and that they should be protected and encouraged in every possible way. Nevertheless, it is undeniable that this rule has some exceptions; that there are some birds which are far from beneficial, being, on the contrary, very injurious, not only to the interest of man, but also to the well-disposed members of their own race. In short, there are robbers and cut-throats among birds as



White-winged Crossbill. *Curvirostra leucoptera.*

well as amongst men; and it is just as sensible to pronounce the human race good for nothing because of the depravity of a portion of its members as to say that birds are useless because a few species are inclined to wrong-doing. The following table will give an idea of the food of the more common birds of Massachusetts, and will serve as a ready means of distinguishing the injurious from the beneficial species:—

FAMILY.	ORDER—Raptors (Robbers).
Falconidae, Hawks	Subsist on small birds and animals and poultry.
Strigidae, Owls	Mice, reptiles, insects and a few small birds.
ORDER—Scansores (Climbers).	
Cuculidae, Cuckoos	Caterpillars and other tree-insects, and a few eggs of other birds.
Picidae, Woodpeckers	Insects (a very beneficial family)
ORDER—Insectores (Perchers).	
Troglodytidae, Humming-birds	Insects.
Cypselidae, Swifts	All kinds of winged insects.
Caprimulgidae, Whippoorwills and Night-hawks	Night-flying Lepidoptera (very beneficial).
Alcedinidae, Kingfishers	Fish.
Coipteryidae, Flycatchers	Flies and other winged insects.
Turdidae, Thrushes	Insects and a few small faults and berries.
Saxicolidae, Bluebirds	Insects.
Sylviidae, Wood inhabitors	Insects.
Paridae, Titmice & Nut hatchers	Insects and their eggs.
Certhiidae, Creepers	Insects.
Troglodytidae, Wrens	Insects.
Sylviolidae, Warblers	Insects and the seeds of weeds and grasses.
Hirundinidae, Swallows	All kinds of winged insects.
Bombycillidae, Chatterers	Various insects and cherries.
Laniidae, Vireos & Butcher-birds	Insects and small birds respectively.
Fringillidae, Seed-eaters	Various seeds, fruits, and some insects.
Icteridae, Starlings, Orioles and Blackbirds	Grains and other seeds, various tree insects.
Cortidae, Crows and Jays	Eggs and young of small birds, a few insects, corn and other grain.
ORDER—Rasores (Scratchers).	
Columbidae, Doves	Berries, nuts and seeds.
Tetraonidae, Grouse	Various seeds, insects and berries.
Perdidae, Partridges	Seeds, berries and a few insects.

- ORDER—Grallatores (Waders).
- Ardeidae, Herons..... Fish, frogs, mice and insects.
 - Charadriidae, Plovers..... Aquatic insects.
 - Scelopacidae, Snipes..... Worms, larvae of insects and grasshoppers.
 - Patulicolae, Rails..... Various insects and water-worms.



Baltimore Oriole. *Icterus Baltimore.*

- ORDER—Natatores (Swimmers).
- Anatidae, Ducks..... Small shell-fish and other aquatic animals.
 - Laridae, Gulls..... Fish and various animals washed up by the sea.

Crows and Robins.

We must say a word in regard to those two birds which have occasioned so much debate among farmers and others,—the crow and the robin. At one time the agricultural papers were continually saying something for or against these birds; and, although not so much is heard on the subject now, yet the question has not been settled to the satisfaction of all. From our own observation, we are compelled to believe that the crow is a very injurious bird, but the robin an equally beneficial one. The crow is acknowledged, even by his friends, to pull up a good deal of corn; but it is urged that he destroys enough insects and grubs to compensate for this injury. Granting this, it leaves them neutral, doing as much good as harm; but this leaves unnoticed the fact that he destroys a great number of eggs and young of small birds which, if permitted to live, would have destroyed vastly more insects than the crow. The robin is blamed for eating cherries and other small fruits. This charge is doubtless just; but we must remember that it is not more than two months that he is injurious in this way, while during the other four months of his stay with us he must be regarded as beneficial.

How to protect Birds.

Of the measures for the protection of birds, perhaps the most important is the bird-law of Massachusetts (Acts of 1870, Chap. 304.), which punishes by fine whoever takes or kills, sells, buys, or has in his possession, the birds named below.

Woodcock are protected between the first day of January and the 15th day of August; ruffed grouse (commonly called partridges), between the 12th day of January and the 1st day of October; quails between the 15th of December and 15th of October. Forfeits, twenty-five dollars for each bird above-named killed or sold out of season.

Pinnated grouse are protected till June 1, 1876; wood or summer ducks, black ducks and teal protected between



Redstart. *Setophaga ruticilla.*

1st of March and 1st of September. Forfeits, twenty-five dollars for each bird killed or sold out of season.

Marsh and beach birds are protected between April 1st and July 15th; exceptions, snipe and plover. Forfeits, ten dollars for each bird.

All other birds, their nests and eggs (except crow black-birds, crows, herons, bitterns, Canada geese, and water-fowl not previously mentioned), are protected through the year. Forfeit, ten dollars for each offence.

The State constabulary, mayor and aldermen, and select men of the several cities and towns of this Commonwealth shall cause the provisions of this law to be enforced in their respective places; and all forfeitures accruing under these sections shall be paid, one half to the informant or prosecutor, and one half to the city or town where the offence is committed.

In itself, perhaps, no fault can be found with this law. It is only because it is not properly executed that it falls short of accomplishing its object. In the neighborhood of the large cities, it doubtless prevents some injury to birds; but in the small country towns we think it is very rarely that an arrest is made; and the select men are quite apt to look the other way to save the trouble of interfering with a neighbor or townsman. We have repeatedly seen strings of ruffed grouse, containing some dozens, which had been taken in abominable snares, being sent into the Boston market from the small towns of Massachusetts. We believe it is still a common practice with many boys to make collections of birds' eggs, and to take not one egg only, but the whole nest, eggs and all, and shoot the parent birds, too, if possible. It is difficult to say how such things may best be prevented; but much good would be done, we are confident, if the selectmen would take the trouble to hunt up and punish a few cases which should serve as an example to others. Parents and teachers may also do much by way of precept and example, and right-



Ptarmigan.

minded boys may do their part by influencing their companions to abandon so cruel a practice.

Bird-houses.

Next to the law, the most important measure for the protection of birds is the putting up of accommodations for them, and thus induce them to settle on our estates. There is no reason why everyone who has a half-acre of land should not have two or three pairs of birds nesting thereon. Perhaps many do not realize what simple accommodations swallows, bluebirds, wrens, and other birds, are eager to avail themselves of. Simple and inexpensive arrangements are just as satisfactory to them as the most elegant and costly ornamental houses; and no one need be prevented by the fear of expense from furnishing dwelling-places, rent free, to these interesting tenants. With a few simple tools and a box or two which any grocer will give you, a bird-house may be made of almost any size or shape desired. Should you wish it highly ornamental, nothing is better than to cover it with rustic-work, which may be done with the aid of a wild grapevine cut in pieces of the right length and nailed on. Such a bird-house costs little or nothing save the time required to make it; and this slight expense will be amply repaid by the satisfaction of doing a good deed.

There are many simple contrivances which may be prepared and put up in five minutes, and will serve the birds as well as anything else. At the opening of the present season we put up four tin cans, such as are used for canning tomatoes, having first filed a small hole in the lower end to prevent the collection of water. Three of the four were immediately occupied by bluebirds. One pair laid five eggs, four of which hatched, and the young grew to maturity. The other two pairs each had two broods, four eggs to each brood, and all hatched; but three of the young died before growing up. Seventeen young bluebirds and their parents, six in number, twenty-three insect-eating birds, were thus induced to make their home in our orchard, the parent birds for about five months, and the young, say about three months. Certainly, at a very low estimate, each bird would average twenty insects a day; for the food of these birds consists entirely of insects. At this rate the old birds would have destroyed during their

stay here, eighteen thousand insects, and the young thirty thousand six hundred, which gives a total of forty-eight thousand six hundred insects destroyed from our own and our neighbor's trees; and it did not take us half an hour to prepare and put up these simple accommodations. Are not these facts eloquent? Then how interesting to watch the housekeeping arrangements of these beautiful little neighbors; to hear their welcome song when winter seemed still with us; to hear them debate the situation, and finally decide in favor of our apple-tree; to see them carrying up grasses and cotton and feathers, and weaving them together into a bed of down for the protection of their early-laid eggs; to watch their love-making, and all their gentle, affectionate ways towards each other; their jealousy of intruders, and their solicitous care of their eggs during the period of incubation; their final joy when the young break the shells, and are born to the light; and their untiring devotion in obtaining choice bits of insect-food for the nourishment of their offspring. Truly here is beauty at our door-yard, and poetry has taken up her abode in our apple-tree.

Purple martins and other members of the swallow tribe will readily occupy boxes put up for their use. Wrens, too, are interesting friends, and are easily induced to settle with us. We know of a case where a pair of bluebirds found a happy home in an old beaver hat which had blown up and lodged in an apple tree. A good bird-house may of a medium-sized flower pot, with the hole somewhat en-



Fig. 15.—Meadow-lark. *Sturnella magna*

larged, and the top covered with a board. Will not everyone who has a dozen rods of land make a bird-house of some kind, and thus help restore the proper proportions of the feathered and insect races?

The Growth of Insects.

The following is from the pen of Prof. Rathvon, of the Lancaster Farmer—

"Many fancy that a little fly is only little because it is young, and that it will grow up in process of time to be as big as a blue-bottle. Now this is entirely wrong, for when an insect has once attained to its winged state, it grows no more. All the growing, and most part of the eating is done in its previous state of life, and indeed there are many insects, such as the silk worm moth, which do not eat at all from the time that they assume the chrysalis state to the time they die."—Church Union.

"That's so"—and yet it is only so in a qualified sense, for there are some insects that never attain to a winged state; that is, they are either totally wingless, or are so seldom seen in that state, that most persons never know otherwise than that they are wingless always. Especially is this the case with ants, fleas, spring-tails, and the females of some bugs, grasshoppers, crickets, beetles, moths, flies, and all lice, as well as many others. Although it is not strictly true that "insects never grow," yet it is true that they never grow after that stage of development when the large body of the insect world attain to a winged state; but there are some orders of insects to which the rule may be applied almost universally. There is nothing that is more likely to leave a false impression upon the minds of the superficial on this subject than the appearance—indeed we often meet persons thoroughly informed on many other subjects, who suppose that the different sizes in insects of apparently the same kinds are indications of different ages. Practically there are four more or less directly marked periods in the life of insects, and are the

ova, or egg state; the larva, or worm state; the pupa, or intermediate state, and imago, or adult state; and in one or the other of these states the species are perpetuated, or carried over from one season to another. In beetles, butterflies, moths, bees, wasps, hornets, flies, dragon-flies, and some others, these states, as a general rule, are very



House-wren. *T. adon*.

distinctly marked; but they are not so in bugs, cockroaches, locusts, earwings, grasshoppers, treehoppers, crickets, and a number of others. In this latitude, perhaps, the one particular species (except the common house-fly) which impresses itself earliest and the most indelibly upon the minds of youth or adult age, is the common "tumble-bug" or "tumble-dung," from its habit of forming a ball out of animal excretions, and rolling it for some distance before burying it in the earth. This is the *Canthon lavis* of entomologists, although there are various species of them. Now, from more than fifty years ago, when we made the first observation, down to five and thirty years ago, we were under the impression that the various sizes of these insects found in the droppings of cattle, were the young and the old of the same species. For, had we not over and over again deprived the industrious and persevering owners of these balls, opened them, and found therein a small black beetle, approximating in form to the former possessors of the ball, and what else, we thought, could they possibly be if they were not their legitimate offspring? These little black beetles, we subsequently learned, were not only different species, but belonged to different genera, *Aphodius*, *Onthophagus* and others. Nor did the fact that we sometimes found within these balls little beetles that were not entirely black—the hinder half of the body being mottled with clay yellow—astonish us any more than that we should occasionally see a Robin, a catbird, or a mouse, that was altogether or nearly white.



Upper fig. Snow-bird. *Junco hyemalis*. Lower fig. Song sparrow. *Melospiza melodia*.

But since then it has been demonstrated to us a thousand times, clear as the light of the living day, that these beetles do not grow or acquire any new beauty after they have assumed the beetle form—nor any other species belonging to the same order—and that all the different sizes indicate different species, or varieties of the same species. The eggs, however, of some insects do very perceptibly increase in size, and the larva or grub grows, and sometimes grows very rapidly, in all of them.

THE American Berkshire Association, head office Springfield, Illinois, offers a premium of \$100 for the best essay on the diseases of swine, their causes, preventives and remedies, said essay to be forwarded by Jan. 1st, 1877.

Shortcomings in Farming.

In driving along the road to attend a ram sale it was our lot to have for a companion a gentleman whose knowledge of farming was evidently founded upon many years of practical experience, to which he had brought to bear a tutored mind well capable of grasping the theoretical views connected with his subject. From such a man, then, it could hardly fail to be anything but painful to us to hear the remark, "Farming is going back; things are not so well done now as they were ten years ago." This was in relation to arable farming. Now, as this is an opinion in which we fully concur, we proceed to offer a few remarks on the present aspect of agriculture.

A few years since a marked improvement could be noted almost everywhere. Hedges were kept in due bounds, waste places were lessened, all the operations of a farm, as hedging, ploughing, drilling, mowing, sheep-shearing, &c., were done to perfection; and the laborers, incited by prizes offered by different agricultural societies, were proud of their work, and did it as perfectly as possible. Now, within the last few years, the agitator has found his way into the villages, where he at first made it his business to persuade his too willing dupes that they were serfs if they did what was required of them, their golden rule being that all men should be paid alike, and all be taught to do as little as possible.

Well, the natural result of all this is that farmers employ as few laborers as they can manage with. Labor-saving machines are multiplied, and with these important work, such as hay and corn harvest, is done in half the time,



Bobolink. *Dolichoronyx oryzivorus*.

and though the wages for the work are tempting, it is soon over. A mowing machine, for example, cutting its twelve acres of grass a day, costs the farmer scarcely more than the price of cider required by the hand-mowers for cutting the same quantity. In wheat harvest the machine easily cuts twelve acres a day, which can be tied and shucked by six men; and though they are paid for this work 5s. an acre, with cider, yet the drink only flows for the day, whereas in hand work four times as much would be required.

Now with these labor-saving machines we have no complaint to make of slovenly work, as we quite think that work done by both the mower and reaper is not only expeditiously, but more perfectly performed; and where machines can be got so to act, there is no doubt that they will be in future in constant and extended use. But in such work as hoeing, though the horse-hoe is extensively used, we are quite sure that the work is not improved, and we indeed conclude that all the work connected with roots is not done with that degree of perfection which prevailed a few years since. Certainly, hand-hoeing and regulating are not done with the same care as when the men on the farm did them, and it was a matter of pride to look constantly over the work. As it is now, the regular laborer cannot do the work he used to, and the consequence is that hoers are got from the pasture districts; and men, and even boys, who have no interest in the farm, and little knowledge of arable farming, scamp over as much as they can, to get extra pay and extra drink in the summer season, with the result of being laid up—real or pretended "rheumatics"—and on the parish during the greater part of the winter.

But where the shortcoming on arable farms is chiefly observable is in a want of neatness in ploughing, drilling, hedging, thrashing, and the like. Formerly prizes were

given by different agricultural societies for neatness and dexterity in different kinds of work; now, however, the men do not care for these things—their whole thought seems to be, not how well or how much can be well done, but how little as to quantity or quality can be got off with.

It is said by some that piece work will cure this; but the spirit now encouraged by sown agitators is antagonistic to piece work. As wages have been pushed up, extra beer is obtained without extra labor, and as money is spent in this way, we fear that the home comforts of the laborer have decreased rather than the reverse—a result we should fully expect from the general doggedness, which designing men know so well how to act upon—and, besides, the extreme ignorance which prevails in many a village is a great bar to progress, even amid prosperity. Now, however, the children are being educated, but at present only not to be brought up to labor, so that more has to be paid for labor on account of its badness and the scarcity of good laborers. Time, perhaps, will come when all will be educated, and when better teaching, better wages, and better food will make better laborers; but this will not yet be.

Under all the circumstances, then, it need be no matter of surprise if agriculture for the present should be "going back," especially in matters of neatness and in perfection of work—things that must be foregone under the present pressure of circumstances.

But here we are going to a ram sale, and the perfection of the animals, and the high prices they fetched, showed clearly enough that the farmer does not grudge a good price for a good article; and, for one, we confess that, if labour improves in quality, we are prepared to have more done, and to pay a high price for it.—*London Field*

Cider Vinegar.

The important factors in changing cider into vinegar are warmth, exposure to the atmosphere, and if obtainable, old vinegar, to hasten the process by mixture. Bearing these things in mind, the farmer had better get up his own apparatus according to his facilities.

We have never found good cider vinegar a very profitable article. The city manufacturers with poisonous compounds can make, at much less cost, something that the majority of people will buy as readily, so that the market for a really good article of vinegar is small and easily overstocked.

We would advise first, to work up waste apples into pork. A lot of Berkshires in your orchard will pick up their own apples and assimilate them without charging you anything for their time. If you have not the hogs, and feel you must go into the cider business, we would next advise you to make and sell all the sweet cider you can. Cider right from the press has cost but little, and you can sell cheap then, if ever. Often we have noticed that sweet cider would sell nearly as well as vinegar, gallon for gallon. Some make air profits, and even large profits, by converting sweet cider into a drink that will keep. This is done by clarifying in various ways by the addition of sugar, which generates alcohol, &c., and will not be suitable business for a temperance man, who disbelieves in fermented liquors.

Making vinegar is the resource of the man who cannot or does not desire to convert apples into pork, and who has a prejudice against fermented liquors. Early apples, having only a small percentage of sugar, do not make good vinegar, and in some cases will not make it at all. We made some cider of the Red June once that inexorably refused to become sour. It was the flattest stuff we ever tasted. The autumn and winter apples, on the other hand, make a cider so sweet that it is difficult to convert it into vinegar without weakening it. (Moreover, in parenthesis, we have known a village "storekeeper" to buy watered vinegar, and prefer it to a pure article, which makes, with the statement just given, a special plea for adulterating the pure juice of the apple, and increases the difficulties of the honest cider vinegar maker.

To make vinegar honestly, however, you should have the vinegar made in warm weather, or at least housed in a warm place, and racked off after fermentation, to clear it of impurities. Expose it to the air as much as practicable, and put a little, or much, sharp vinegar in each barrel or other vessel in which the cider is placed. By attention a little leaven of vinegar can convert a great deal of cider into vinegar.

This can be done by anybody with common appurtenances. Of course it is not the most rapid nor, on a large scale, the most profitable method of manufacture, but we think it the best for common farmers.—*Prairie Farmer*.

Health of Country Homes.

The House—The only probable source of danger to health in a farm-house lies in the condition of the cellar, or of the space which separates the lowest floor from the ground. If there be a cellar, observe whether it is dry and free from standing water or decaying vegetable matter (allowed to accumulate there through the negligence of servants). If the house is built upon the ground, the lower floor should be at least 18 inches above the ground, and the sides should be so open that the air can circulate freely through the space.

The Well.—If the water is clear and sweet, and free from any unpleasant odor, one may pretty safely assume that no harm is to be anticipated from this source. Farmers are often in the habit, however, of hanging meat in the well for the purpose of keeping it cool. A pretty severe epidemic (in 1874) of diarrhoea, in a boarding-house at one of the healthiest Long Island summer resorts, was traced to the existence of a decomposing shoulder of mutton at the bottom of the well, into which it had accidentally fallen.

The Privy.—There is little or no danger from contamination of the air by the contents of the privy. The real danger lies in the diffusion of these contents through the soil and their contamination of the water of the well. To avoid such a possibility, the privy should be placed at least 60 or 70 feet from the well, and—if the direction of the natural drainage currents be known—in such a position that the contents of the privy will drain away from the well. Better yet, let the privy be so constructed that its offensive contents shall simply lie upon the surface of the ground, and let there be easy access to it from behind, so that fresh earth may be frequently added, and the entire accumulation removed, say once a week.

The Slops.—How common is it for the kitchen authorities in a farm house to throw the slops upon the ground, just outside the kitchen door, and perhaps within six feet of the well. I have known of a boarding-house epidemic of diarrhoea which could be traced to no other source than the contamination of the well-water by a shallow pool of sun-exposed, foul-smelling slops. A cemented cistern should be built about 75 or 100 feet from the house, and at a distance from the well, and to this all the kitchen slops, vegetable waste, &c., should be conducted through a suitable pipe or conduit. From the cistern these matters may be fed to the pigs, or thrown upon the ground at a proper distance from the house.

The Ice.—The ice may be so loaded with foul vegetable matter as to give rise to quite severe disturbances of the bowels and stomach. If it be found free from imbedded impurities, and if, when melted, it be free from an unpleasant odor, one may safely assume that no danger is to be anticipated from this source. An interesting epidemic of bowel troubles were traced to impure ice last summer at Rye Beach.

Drainage.—This is a more difficult subject to investigate, and one concerning which I hardly dare venture any remarks in this place. In a general way, however, the statement may be made that pools of standing water, or marshy flats near brooks or streams (except perhaps at the seaside), are not desirable neighbours. This is especially the case if the house in which you live is situated in a hollow (as in some mountain valley, however elevated it may be above the sea), where the air does not freely circulate. The prevalence of typhoid fever in some of the Vermont and New York mountain valleys, especially in the early autumn, is probably to be explained by the existence of just such conditions. In the case of a large hotel, the investigation should be practically the same as in the case of a farm-house. The difficulties in the way of such an investigation will be found, however, to be much greater, and it would probably be better in such a case to secure the assistance of some physician or engineer who is familiar with the subject.—*New York Tribune*.

Training a Sheep-dog.

Accustom the dog to its name early, and perhaps, out of reverence for the ways of the past, it would be well to yield to the Scottish shepherd's superstition, and call him after a flowing river, "for then ye ken he will surely never gae mad." Always treat the young dog kindly, but on no account play with him or allow children, or indeed any other person, to notice him at all. It is really marvellous how quickly they will learn a bad habit or way, which is far more difficult to get out of them than teaching them fresh work. If you are patient and gentle you can very quickly teach the whelp to lie down at command (the first lesson), then to come this way or that, always behind you. In a short time he will leap over a hedge at your bidding, stand still at command; or even walk backwards or forwards as you wish. All this may be done before even it sees a sheep, and indeed many whelps have been thoroughly trained before they have been called upon to work. The more general practice, however, is to take the young dog alone, when quite strong enough to keep a few sheep up in a corner of a field, and teach him to bring them after you short distances, and so make him handy at working to the right or left. He should never be allowed to run between his trainer and the sheep, for the great object ought to be to throw the dog well off so that he may run wide. There is a great boldness and dash in a colley so taught, and he does not harass the sheep nearly so much as one in the habit of running at or close after them. You may teach him to obey signs, or words, or a whistle, and for far distances on the mountain the last is best. A dog so taught will gather miles of mountain, bringing all the sheep to the shepherd's feet, and then by an alteration in the note will take them right away back again. It should always be borne in mind that the sagacity, or sense if you will, of the colley develops with his years; and therefore, if you are quiet and patient and have plenty of work for him, he will teach himself rapidly without your worrying yourself very much about him. "Have you taught 'Tark' yet?"

said a young farmer to a friend to whom he had given a valuable whelp. "No, I have not," was the reply, "for by my word I think he will teach me; he appears to know far more about the sheep and how to manage them than I do. Our lads laugh, and say he is more knowing nor a Christian." It is so, and as that extraordinary and too little appreciated man, the late Mr. Rarey, said of horses, "we know very little about them, ladies and gentlemen;" so of all animals, and especially the dog. Why, therefore, collies so finely strung that you can make them whine with pain by merely a look, and others so bold that no amount of beating will break their spirit. Therefore treat them as reasoning animals. It would be hard indeed for an intelligent man who had been working steadily upon the mountain with sheep dogs for a whole season, and witnessed day by day their shrewd cleverness, to declare that they do not reason. The dog that brought the shepherd's boots one by one up to his bedside from the room below, and tried to rouse the poor fellow from out of the fever in which he lay, to put them on, surely was guided by something higher than mere instinct. The great black colley that threw himself against the cottage door, to induce the inmates to come out and open the mountain gate, through which he was unable, without aid, to pass, as related in *The Field* last year, surely considered how he should act and obtain egress from the pastures to the open mountains, and acted upon his thought.

Stock in Southern Africa.

It would seem that there is an opening for some enterprising exporter of stock to make capital in South Africa. According to a paper which was read before the Society on Arts the other day, by Mr. T. B. Glanville, the natives at the Cape have taken a "fancy" to stock-raising, and further, they seem extremely anxious to improve the objects of their fancy. Mr. Glanville says that if the natives of South Africa were all honest men, it would tell very much in their favour to be able to say that a portion of them—the Basutos-Kaffirs, Fingoes, and others clustering about the Eastern borderland of the Cape—own more than two million head of domestic animals, valued at £3,500,000, comprising half a million of horned cattle, 1,000,000 sheep, 369,429 goats, 62,244 horses, and 16,000 pigs. Mr. Glanville, however, fears that these flocks are "taunted with the suspicion of being ill-gotten;" but when we consider that it is not so very long ago that "cattle lifting" was quite a profession on the borders, we should be a little charitable towards the uncivilized tribes of Southern Africa. Mr. Glanville's lecture contained several interesting facts relative to the stock products of South Africa. He says:—

"The long-inherited habit of the South African native is a delight in horned cattle. The habit has grown up from many motives. The natives are great milk drinkers. It is with cattle they buy their wives. And they have a gentlemanly liking for a fine animal, and especially for a swift racing ox. Then, again, a large herd is a sign of wealth and respectability. It has not been the custom of the native to take a commercial view of horned cattle, unless in relation to wife-buying. But within the last few years a preference for sheep has shown itself, and on the sole ground of the profitableness of wool. The Kaffir is actually beginning to barter away his beloved and cherished cattle for an animal which promises to be remunerative.

One magistrate says:—Such is the value attached by the Kaffirs to the production of wool, that a few of them in the district have hired sheep from Europeans, and many have exchanged the largest oxen, usually kept for show or for ox races, for sheep. The magistrate of Queenstown says:—The Tambookies also thoroughly understand the value of woolled sheep, which are gradually superseding their fancy for cattle. Very large quantities of wool are now produced in the location.

The Governor's agent in Basutoland reports that, in 1873, 2,000 bales of wool were exported from Basutoland. The magistrate with the Fingoes says:—Sheep still increase in large numbers. The agent with Krelis reports:—Woolled sheep are much sought for, and cattle are readily given in exchange for them. The agent with Gangelizwe says:—The quantity of wool sent away by the traders shows the country to contain large numbers of sheep. The magistrate of King Williamstown says:—It is as significant as it is gratifying to record the fact that the natives are turning their attention more than ever to woolled sheep, exchanging oxen, which are now selling at a high price, for sheep. Large quantities of wool are now being raised by the natives, and in not a few instances creditable exertions have been made in the get-up of the article, so that gradually and by degrees they are entering into close competition with the regularly established sheep farmer. The resident with Krelis says:—Sheep are also eagerly sought after, and within the past week some farmers from the colony have bartered away a large flock for cattle. About 300 bales of wool have been produced and disposed of in this part.

These official statements, coupled with the fact that the natives about the eastern and north-eastern portions of the Cape Colony possess a million sheep, may be taken to prove that the change I have referred to is not to be doubted. The natives of South Africa are becoming sheep owners. What does this mean? It certainly does not mean that the Kaffirs, Fingoes, and Basutos are beginning to prefer the sheep as a fancy animal to the ox, or to like mutton as an

article of food better than beef. The simple but significant truth is that the natives, as I have already said, have learnt the commercial value of sheep and are ready to sacrifice old habits and long inherited tastes to a new born idea of utility and desire for profit. The change means more than this; for as the use of the plough and the disuse of the pick involve the labour of the men instead of the women in agriculture, extended cultivation, enlarged production, a surplus beyond personal wants for trade, and the growth of property; so the preference for sheep involves an additional demand on the labour of the men in shearing, cleansing, sorting, packing, and all the arts, however humble, of preparing wool for the buyer.—*Eng. Live Stock Journal.*

The Moon and the Weather.

The notion that the moon exerts an influence on the weather is so deeply rooted that, notwithstanding all the attacks which have been made against it since meteorology has been seriously studied, it continues to retain its hold upon us. And yet there never was a popular superstition more utterly without a basis than this one. If the moon did really possess any power over the weather, that power could only be exercised in one of three ways—by reflection of the sun's rays, by attraction, or by emanation. No other form of action is conceivable. Now, as the brightest light of a full moon is never equal in intensity or quantity to that which is reflected toward us by a white cloud on a summer day, it can scarcely be pretended that weather is affected by such a cause. That the moon does exert attraction on us is manifest—we see its working in the tides; but though it can move water, it is most unlikely that it can do the same to air, for the specific gravity of the atmosphere is so small that there is nothing to be attracted. Laplace calculated, indeed, that the joint attraction of the sun and moon together could not stir the atmosphere at a quicker rate than five miles a day. As for lunar emanations, not a sign of them has ever been discovered. The idea of an influence produced by the phases of the moon is therefore based on no recognizable cause whatever. Furthermore, it is now distinctly shown that no variations at all really occur in weather at the moment of changes of quarter any more than at other ordinary times. Since the establishment of meteorological stations all over the earth, it has been proven by millions of observations that there is no simultaneousness whatever between the supposed cause and the supposed effect. The whole story is a fancy and a superstition which has been handed down to us uncontrolled, and which we have accepted as true because our forefathers believed it. The moon exercises no more influence on the weather than herings do on the government of Switzerland.—*Blackwood.*

A Big Wheat Farm in Pombina.

A gentleman who came down from the North Pacific the other day gives to the *St. Paul Pioneer Press* the following interesting notes in relation to Dalrymple's great wheat farm.—The amount of ground sown to wheat this spring was 1300 acres. Harvesting commenced on Monday with nine self-binders. The machines are run fifteen hours without rest, except the ordinary stops for oiling, lunch and dinner, and the result per day is 180 acres. One man is employed to each team, and twelve men follow the machines shocking the wheat as soon as it is cut. The entire 1300 acres were to be cut and shocked during the week; stacking and threshing will of course follow. Dalrymple is harvesting his crop for about one-fifth of the cost required under the system in vogue ten years ago. At the time harvesting commenced it was estimated the yield per acre from the entire tract would not be less than twenty bushels to the acre. Grasshoppers had done but little damage, the excessive hot weather came too late to blast the crop, and everybody who saw the waving grain pronounced big wheat farming on the North Pacific a success. The farm on which this crop was grown consists of 30,000 acres, on which next season there will be sown to wheat, 9,000 acres, the sod of it having been broken this season. During the breaking season Mr. Dalrymple had as high as one hundred teams at work. The furrows turned were six miles long, and the teams make but two trips a day, travelling with each plough, to make the four furrows, twenty-four miles. The location of this farm is eighteen miles west of Moorhead, Minnesota, in the proposed new territory of Pombina, and this is not the only big farm in the vicinity, but is the "boss" farm of a dozen or more running from 500 to several thousand acres.

The Ants of Africa.

When they grow hungry the long file spreads itself through the forest in a front line, and attacks and devours all it overtakes with a fury that is quite irresistible. The elephant and gorilla fly before this attack. The black men run for their lives. Every animal that lives in the

line of march is chased. They seem to understand and act upon the tactics of Napoleon, and concentrate with great speed their heaviest forces upon the point of attack. In an incredibly short space of time the mouse, or dog, or leopard, or deer, is overwhelmed, killed, eaten, and the bare skeleton only remains. They seem to travel night and day. Many a time have I been awakened out of sleep and obliged to rush out of the hut into the water to save my life, and, after all, suffer intolerable agony from the bites of the advance guard, who had got into my clothes. When they enter a house they clear it of all living things. Cockroaches are devoured in an instant. Rats and mice sweep round the rooms in vain. An overwhelming force of ants will kill a rat in less than a minute, in spite of the most frantic struggles, and in less than another minute its bones are stripped. Every living thing in the house is devoured. They will not touch any vegetable matter. Thus they are, in reality, very useful (as well as dangerous) to the negroes who have their huts cleared of all abounding vermin—such as immense cockroaches and centipedes—at least several times a year. When on their march the whole insect world flies before them, and I had the approach of a bashikouay army heralded to me by this means. Wherever they go they make a clean sweep—even ascending to the tops of the highest trees in pursuit of their prey. Their manner of attack is an immense leap. Instantly their strong pincers are fastened, and they only let go when the piece gives way. At such a time this little animal seems animated by a kind of fury which causes it to disregard entirely its own safety and to seek only the conquest of its prey. The bite is very painful. The negroes relate that criminals were in former times exposed to the path of the ants as the most cruel manner of putting them to death.

Sagacity of the Horse.

An amusing incident, and one in which the intending buyer was well hit, occurred the other day in North Lancashire. A builder was in want of a horse, and had the offer of one from a dealer who was noted for doing a little bit of sharp practice whenever a convenient opportunity offered. The two lived a few miles apart, and the preliminary negotiations had been conducted by letter, and a day was set apart for the dealer to bring the horse. He had invested it with every good property, and had stated its age, &c. As the builder was not very well conversant with horse flesh, he induced a friend, a retired farmer, to go with him to inspect the animal. Accordingly they went. The animal was in good condition, and apparently well calculated for the required work. A price was named, which the builder thought a long one for an aged horse. The farmer had been critically looking over the animal. "Suppose," said he to the dealer, "you add five years to the age you name; don't you think you would then be nearer the mark?" The dealer protested the age he had given was correct—he had had him so many years, and he bought him from the breeder. "You did no such thing," said the farmer; if I am not mistaken I bred the horse myself." An altercation followed; each was positive, and the builder was on the horns of a dilemma. At length the farmer settled it thus—"You say the horse is so old—I say he is five years older; you ask £50 for him—I say £30 is enough. I will wager a £5 note that I prove the correctness of my argument, and on the result the price shall depend. Let the horse be taken into the yard of my late farm; let the harness be taken from off him, and if he does not at once, without any direction, go into No. 3 stall in the stable I will previously point out, then I will forfeit the £5, and you shall have £50 for the horse. If he does as I say, then you sell him for £30 and lose your bet of £5." The dealer was in a corner, but he had previously been so positive that he could not find any pretext for declining the challenge. The horse was taken to the farmyard (and it may be here remarked that the stable was not visible from the part where he was unharnessed), and immediately on the gear being taken off him, he gave himself a shake, trotted round a corner of the yard, went direct to No. 3 stall, and was apparently quite at home in his new-old quarters. The sequel was that the builder obtained his horse at a fair value, the retired farmer his £5, and the biter was well hit.

A Fish that Bears its Young in the Mouth.

The *chromis paterfamilias* has the gills disposed in simple laminae; it is unprovided with any special apparatus for retaining the eggs or the young ones, and yet it brings up about 200 young in the mouth and gills. It is always the male that performs these functions of incubation. After the female has deposited the eggs in a depression of the sand or between the tufts of reed, the male approaches and takes them by inhalation into the cavity of the mouth. From there some movement, the mechanism of which we have not been able to observe, sends them between the leaflets of the gills. The pressure exerted on the eggs by the bronchial laminae suffices to keep them in place. There in the midst of the organs of respiration, the eggs undergo all their metamorphoses. The young ones grow rapidly,

and soon appear much inconvenienced in their narrow prison. They leave it, not by the gills, but through the opening by which the bronchial cavity communicates with the mouth. Here they remain in great number, pressed against one another like the seeds in a pomegranate. The animal's mouth becomes so distended by the presence of this numerous progeny that actually the jaws cannot meet. The cheeks are swollen, and the animal presents the strangest aspect. Some of the young, arrived at the perfect state, continue to live in the gills. All have the head directed toward the buccal opening of the father, the protecting cavity of which we have not seen them leave even for a moment. Though so numerous they hold their ground very firmly, but how they do so we have not discovered. Neither can we understand how the nursing father avoids swallowing his progeny; we are also ignorant at what period of their life the young ones leave the paternal mouth to live independently.—*Popular Science Monthly.*

A Spider's Bridge.

One chilly day I was left at home alone, and after I was tired of reading Robinson Crusoe, I caught a spider and brought him into the house to play with. Funny kind of a playmate, wasn't it? Well, I took a wash-basin and fastened up a stick in it like a liberty pole or a vessel's mast, and then poured in water enough to turn the mast into an island for my spider, whom I named Crusoe, and put on the mast. As soon as he was fairly cast away, he anxiously commenced running around to find the road to the mainland. He would scamper down the mast to the water, stick out a foot, got it wet, run round the stick and try the other side, and then run up to the top again. Pretty soon it became a pretty serious matter with Mr. Robinson, and he sat down to think it over. In a moment he wanted to shout for a boat, and was afraid he was going to be hungry. I put a little molasses on a stick and a fly, but Crusoe was not hungry for flies just then. He was homesick for his home in the woodshed. He went slowly down the pole to the water and touched it all round, shaking his little feet like pussy when she gets her stockings wet in the grass, and suddenly a thought seemed to strike him. Up he went like a rocket to the top, and commenced playing circus. He held one foot in the air, then another, and turned around two or three times. He got excited and nearly stood on his head, before I found out what he knew, and that was this: the draft of air made by the fire would carry a line ashore on which he could escape from his desert island. He pushed out a web that went floating in the air until it caught on the table. Then he hauled on the rope until it was tight, struck it several times to see whether it was strong enough to hold him, and walked ashore. I thought he had earned his liberty, so I put him back in the woodshed.—*Hearth and Home.*

American Sumac.

The demand for American sumac has increased largely of late years among morocco manufacturers and dyers, and many improvements have been made in its preparation. The quality of the native article has now arrived at great perfection, and mills for grinding have sprung up all through the Southern and Middle States. It has not been a profitable business for the past years, having suffered from the depression incident to all branches of trade.

Sumac grows all over the continent, but that best suited for tanning and dyeing purposes grows spontaneously in a belt of country, running from Maryland down through Virginia and the Carolinas, thence through the northern sections of Georgia, Alabama and Mississippi, and in portions of Kentucky and Tennessee. The northern climate seems too cold to develop the tanning properties of this plant, but large quantities of Pennsylvania and New York sumac are sold in the leaf to tanners of goat-skins, who put it in the vats to strengthen up and keep the sewed skins from leaking, and it is also used by many tanners who wish to brighten the color of their leather.

The Indian name of sumac is killikinick; they used it, and it is still used, to mix with tobacco for smoking purposes.

The season for picking sumac commences with the 1st of July and ends the last of September, or with the first frost, for this turns the leaf red, and then it is worthless. The stems, except the leaf stems, have no strength, and should not be gathered. They are full of pith, and if ground they only absorb the strength of the leaf and depreciate the value of the article. Sumac should be gathered in this way, viz: Break off the parts of the bush containing the leaves, but do not gather the blossoms or berries. Some sumac gatherers allow the leaves to wilt a few hours in the sun, while others convey them immediately into the shade or under cover. It is cured under shelter to preserve its color and strength; when it is dry it is put in bulk, and when dry and windy days set in, spread out in beds as you would wheat or oats, on a clean plank floor. Then it is threshed with a flail, when the leaves and stems will break up fine, and the large stems are raked away. In drying, before threshing, it should be frequently thrown over with a pitch fork to let the air get to every part of it.

Table listing various cow breeds and their prices, including Forest Queen, Duchess, and others.

Table listing bulls and their prices, including Earl of Springhill, Fannie Leslie's Gwynne, and others.

Also a sale at Monroe, Iowa, Aug. 30, from the herds of Mrs. J. S. Long and J. G. Long of that place, and D. M. Flynn of Booneville, at which the following were the leading prices obtained:

Table listing cows and heifers with prices, including Mazurky, 3d Lady, Forest Lady, and others.

Table listing bulls and their prices, including Highland Prince, 1st Duke of Underdore, and others.

At the same time and place, the following animals, the joint property of Mrs. J. S. Long and D. M. Flynn, not originally included in the offerings, were afterwards offered with the privilege of the owners bidding upon them:

Table listing female and bull animals with prices, including Highland Maid, 1st Duke of Underdore, and others.

A sale of Short-horns belonging to Dr. G. Sprague was held at Des Moines, Iowa, August 31st. We give below the prices made of \$300 each or over:

Table listing cows and heifers for sale, including Constance of Oakwood, Lady Constance, and others.

Joseph Duncan's Herd. This sale came off at Osborn Station, Mo., on the 23rd August, with the following results:

Table listing cows and heifers from Joseph Duncan's herd, including Moss Rose, Rival, and others.

Summary of sales results for Joseph Duncan's herd, showing 22 females and 10 bulls sold.

J. P. McCulley's Sale. Cows and heifers including Iowa Maid and c. c., Red Bud and b. c., and others.

Table listing bulls for sale, including Crook Tail Lad, Leroy, and others.

M. L. Devin's Herd. Cows and heifers including Sallie 2d, Mary Lookout, and others.

Table listing bulls and bull calves for sale, including Cherub's Chief, Aldric Chief, and others.

Wm. Hastie's Herd. Cows and heifers including Young Daisy, Lilly Ann, and others.

Table listing bulls for sale, including Highland Prince, 1st Duke of Underdore, and others.

Beaumont Grange, England. On the 5th September Mr. Thornton began a series of sales in the north of England.

Table listing cows and heifers from Beaumont Grange, including Lady Bates, Royal Chatter, and others.

Summary of sales results for Beaumont Grange, showing 47 cows and 13 bulls sold.

Table listing bulls for sale, including Thorndale Duke, Duke of Siddington, and others.

Killhow—Sir W. Lawson's Herd. The following day the following animals were sold at Killhow:

Table listing cows and heifers from Killhow, including Rosamond, Boudica, and others.

Wallenstein. Name: Rosamond, Boudica. Price: 355, 175.

Table listing cows and heifers for sale, including Waterloo 22nd, Seraphina 19th, and others.

Newbie House Sale. On the Friday following Sir W. Lawson's sale, that of Newbie House came off as follows, and immediately thereafter a consignment of five head belonging to Hon. M. H. Cochrane of Quebec found ready purchasers:

Table listing cows and heifers from Newbie House, including Lord of Braemar, Wetherby Star, and others.

Table listing bulls for sale, including Lord of Braemar, Wetherby Star, and others.

Summary of sales results for Newbie House, showing 47 cows and 13 bulls sold.

Table listing cows and heifers for sale, including Eliza, Lovely Lady, and others.

Summary of sales results for the second set of animals, showing 47 cows and 13 bulls sold.

Table listing bulls for sale, including Earl of Clare, Knight of Knowlmer, and others.

Summary of sales results for the third set of animals, showing 47 cows and 13 bulls sold.

Table listing cows and heifers for sale, including Earl of Clare, Knight of Knowlmer, and others.

Summary of sales results for the fourth set of animals, showing 47 cows and 13 bulls sold.

Table listing bulls for sale, including Earl of Clare, Knight of Knowlmer, and others.

Summary of sales results for the fifth set of animals, showing 47 cows and 13 bulls sold.

Table listing cows and heifers for sale, including Earl of Clare, Knight of Knowlmer, and others.

Summary of sales results for the sixth set of animals, showing 47 cows and 13 bulls sold.

Stock Notes.

IN ADDITION to the polled yearling bull and yearling heifer noticed last week as having been purchased from Lord Fife and Mr. Hannay by Professor Brown for the Government Experimental Farm at Ontario, we understand that the Professor has bought a splendid polled cow from Mr. Farquharson, of Haughton, Alford, mostly of Tillyfour blood, at 70 guineas.

2000 GUINEAS FOR A HEIFER.—This handsome sum has recently been paid by Mr. Holden of Laurel Mount, Shipley, Yorkshire, to Mr. Cheney, Gaddesby Hall, Leicestershire, for the fine yearling heifer 17th Lady of Oxford, by 9th Duke of Geneva, out of 13th Lady of Oxford.

SHORTHORNS FOR CANADA.—Prof. Brown has selected a promising young Shorthorn bull, and a splendid heifer of good Booth blood from the Queen's herd at Windsor for the Government Experimental Farm, Ontario, Canada.

BORDER LEICESTERS FOR CANADA.—Besides the five gunners mentioned last week, Professor Brown has purchased a fine shearling Leicester ram from Mr. Ferguson, Kinnochry, for the Ontario Government Experimental Farm. The price of the ram is 30 guineas.

A BIG DROVE OF CATTLE.—One of the largest droves of cattle ever sent from Texas, was, a few weeks since, driven from Capt. King's rancho in Neeces County, to Kansas. The herd numbered 30,000 horned cattle, and needed 700 drivers. The cattle were disposed of for \$60,000, being about £2 a head.

JOHN SNELL'S SONS, Edmonton, Ontario, have recently sold the following Cotswolds: To L. E. Brown, Eminence, Ky., two ram lambs and one ewe lamb; to W. L. Waddy & Son, Peytona, Ky., one ram lamb, one ewe lamb, and one shearling ram; to T. W. Samuels and Sons, Deatesville, Ky., 27 ram lambs, three ewe lambs and one shearling ewe; to H. S. Webster, Union Mills, Ind., one ram lamb; to Brown, Crabb & Allen, Eminence, Ky., one imported shearling ram; to E. M. Chrisman, Merritt, Ills., one ram lamb; to M. L. Stewart, Camp Point, Ills., one ram lamb, one shearling ewe, four aged ewes. To Wm. M. Miller, Claremont, Ont., one ram lamb; to James Russell, Richmond Hill, Ontario, one shearling ewe. Also, Berkshires, as follows: To A. A. Knott & Bro., of Iowa, one imported sow, Duchess of Gloster, five pigs by Lord Liverpool, and three young sows; to T. J. Crutcher, Shelbyville, Ky., one boar and one sow; to Ed. F. Rankin, Monmouth, Ills., one boar pig; to Henry Warren, Newton, Ia., one boar pig; to J. McReynold, Missouri, one boar and one sow; to Walter Ayres, Jacksonville, Ills., one imported boar pig; to N. H. Gentry, Sedalia, Mo., one imported boar pig, two imported sow pigs; to J. P. Hodine, West Jersey, Ills., one boar pig; to I. W. Mason, Burnside, Ills., imported boar Duke of Gloucester.

Mr. Wm. Watson, Jr., New York, has purchased of Wm. Rodden of Canada the Ayrshire heifers Lily, 2729, and Amelia, 1981, together with the b. c. Gen. Montgomery. These animals formed part of Mr. Rodden's exhibit at the Centennial, where they attracted much favorable attention.

Correspondence.

READER—Guelph.—The green tomato worm is not poisonous, although popularly supposed to be so. In the fall they descend to the ground and change to the chrysalis form, and in spring come forth as the large spotted sphynx moth (*Sphinx quinquemaculata*).

PRIZE FOWL FOR BREEDING—Chanticleer, Paisley.—If you imagine that the purchase of a trio of "prize birds" will necessarily result in the speedy possession of a progeny of exactly the same excellence, you will likely find yourself entirely mistaken. It must not be forgotten that the birds we see at our Provincial and other fairs are selections made from among hundreds of fowls equal in almost every respect to the chosen few, and it is scarcely to be expected that the number of "prize birds" among their progeny will be in any greater proportion when brought into like competition. Besides, it is a well-known fact that "prize fowls" are not always the best breeders. We by no means discourage the breeding of choice strains; on the contrary, we recommend the breeding of none other. What we wish to guard our readers against is the tendency to expect more than what on a moment's reflection will appear reasonable, and thus prevent certain disappointment.

THE 6TH DUKE OF HILLHURST.—Querist, Bobcaygeon.—The 6th Duke of Hillhurst was got by 11th Duke of Geneva from Mr. Cochrane's Airdrie Duchess 2nd. The price of the dam was \$18,000.

FEEDING COLTS.—Horseman, Trafalgar.—Four to five pounds of oats and eight to ten pounds of hay is a fair daily allowance for colts, from weaning time until they are a year old. An occasional feed of carrots, in lieu of the oats, will be found very beneficial. Many persons will consider the allowance specified extravagant, but as the after development of the animal depends largely upon the treatment it receives at this period of its existence, anything like stint would be suicidal in the extreme.

SAWDUST FOR STABLING.—S. Johnston, Pontiac.—Sawdust is preferable to straw, for bedding, in many respects. It is a better absorbent, and horses lying upon it receive fewer stainers, etc., than they do when reposing on straw; its absorbent qualities also constitute it in the end a most valuable manure. It is an excellent substance for the feet, preserving the hoof cool, moist, and in exactly the condition to ensure health of limb. And lastly, it is cheaper than straw, and being more compact is more easily handled and less subject to waste.

HIGH PRICED LEICESTERS.—Kenny, Waterloo.—(1) The highest price we think of at present is \$1,000 paid for a ram at Lord Polwarth's sale three years ago. (2) Atwood merinos have brought as high as \$20,000, but the purchasers were no doubt lineally descended from and inherited the mental eccentricities of the "tulip" mania dabblers, and their actions do not at this particular time of day materially affect the market.

FOUNDER IN PIGS.—Ronald, Ancaster.—This disease is sometimes occasioned by over-feeding with highly concentrated food. The animal not unfrequently loses the use of one or both hind legs and becomes quite helpless. Bleeding, produced by nipping off a portion of the tail, has proved successful in many instances. If one cutting is not sufficient; repeat the operation.

PRIZES FOR WALKING HORSES.—X., Sombia.—We have repeatedly advocated in these pages the offering of prizes for walking horses. A rapid walking gait is one of the most desirable qualifications of ordinary farm horses, and why it is Agricultural Societies have so long ignored this very important matter in revising their prize lists we are totally at a loss to conjecture.

WILL THE POTATO BUG EAT CABBAGE?—Enquirer, Delaware.—Yes, and even thistles, may even the deadly night shade. We have never heard of its having eaten grindstones or anvils, but failing a supply of anything else we would not be at all surprised at seeing it attack even these.

STRAW ASHES AS MANURE.—N.M., Port Hope.—We are not aware of straw ashes having been even experimented with as a manure in this country, further than the results produced by the accidental or intentional burning of stubble. That it is a valuable manure there is no doubt; and in England a short time since the question was discussed whether it would not be more profitable to use the straw in this manner than to purchase guano and other costly manures. If our correspondent can spare straw to experiment with we shall be happy to publish the results.

Patrons of Husbandry.

Sub Grange.

529 HERFORD.—John Cowen, Master, Hereward; William Hamilton, Secretary, Hereward.

Division Granges.

32 NORTH BRUCE.—John Biggar, Master, Burgoyne; Alfred Shiell, Secretary, Burgoyne.
25. HALLIMAN.—Henry Ivey, Master, Jarvis; Jesse Forster, Secretary, Mainham Centre.

The third annual meeting of the Dominion Grange was held in Toronto on Tuesday, October 3rd.

W. PEMBERTON PAOL, Secretary D. G.

Catalogues &c., Received.

We have received the first number of the "Dominion Poultry Gazette," published in Galt, Ont. The matter bespeaks a thorough knowledge of the subject in hand, and the typography is highly creditable.

Bruce & Co's (Hamilton, Ont.) Bulb catalogue has reached us. It is well illustrated and contains a good deal of useful information.

The Bloomington Nursery catalogue is also to hand, with price list, &c.

HARDY APPLES.—A. McD., Muskoka.—The Duchess of Oldenburg and the Tetofsky are among the hardest. Stewart's Sweet is also a very hardy variety. Tallman Sweet and St. Lawrence answer in most localities, but the weight of evidence appears to be on the side of the three first named.

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