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# THE ILLUSTRATED JOURNAL of AGRICULTURE



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MONTREAL, SEPTEMBER 1, 1894.

\$1.00 per annum, in advance

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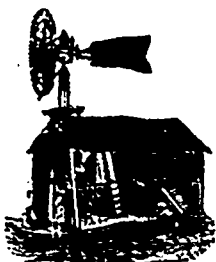
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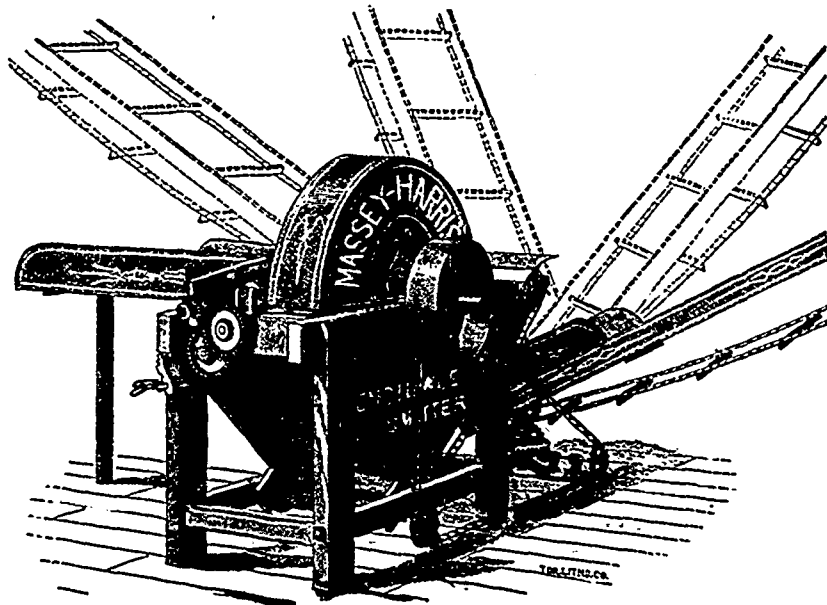
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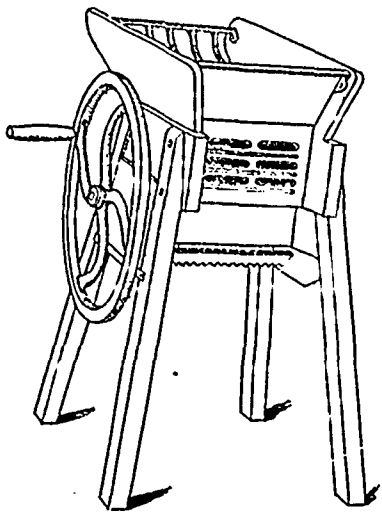
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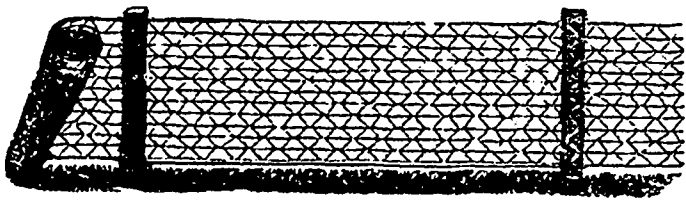
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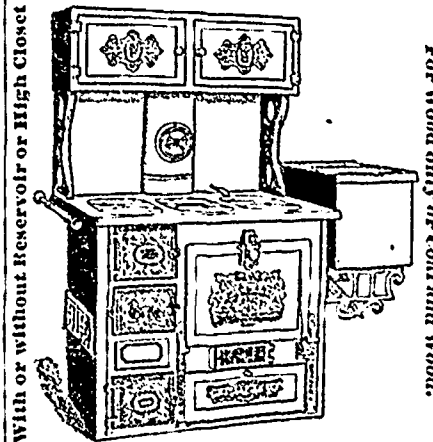
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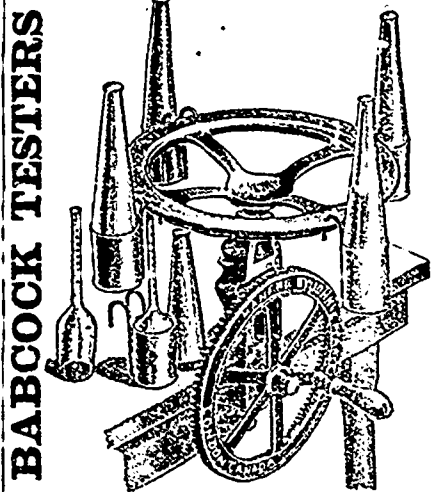
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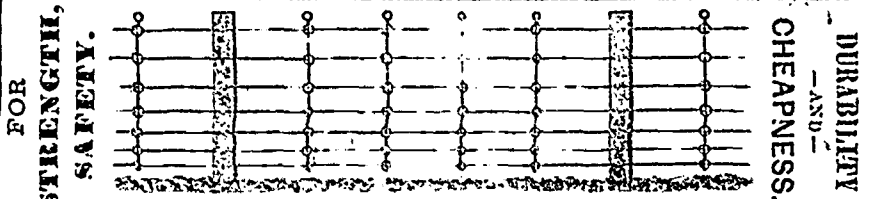
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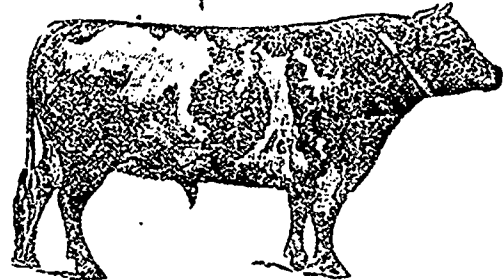


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THE ILLUSTRATED  
Journal of Agriculture

Montreal, September 1, 1894.

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Notes by the Way.

**Crops in England.**—It may interest some of our readers to hear that the present prospects of crop-yield in England are very different from the appearance of last year. Wheat shows a probable average yield of at least 32 bushels an acre, and the hay-crop has been enormous and was carried in splendid order. We give a computation, made by correspondents of "The Times," of the relative yield of last year and the present:

Wheat.....1894.....101.8	Wheat.....1893.....82.1
Barley.....".....102.9	Barley.....".....73.8
Oats.....".....105.4	Oats.....".....80.4
Horse-beans.....".....100.9	Horse-beans.....".....64.7
Potatoes.....".....96.7	Potatoes.....".....86.7
Grass.....".....110.0	Grass.....".....44.0

By this table, it may be seen how utterly impossible it is for the very best farming in the world to contend against unpropitious seasons. The persistent drought of 1893, coupled with the low price of every thing except oats, brought many a farmer to ruin. And, yet, in spite of the drought, the English wheat-crop was more than double per acre the wheat-crop of the States: the average of the former was 26 imperial bushels—63 lbs.—of the latter 12½ bushels of 60 lbs.

**Barley.**—Barley, as we ventured to prophesy a few weeks ago, was cut here—Pointe-Claire—by the 18th July. Sown in April, on a warm loam, with a warming slope to the South, it could not fail to be precocious. My neighbour's wife, Madame V., told us her chickens were doing famously, for they had found their way into the barley field! A nice mess they made of it, too: expensive way of fattening fowls.

**The Beaconsfield vineyard.**—A more disgraceful sight than the vineyard planted some 12 years ago by Mr. George Gallagher we never saw. The land is like a foul meadow: grass, thistles, and other weeds mown over in June, are now needing the scythe again—July 25th.—Mr. Menzies' original plantation of grapes is now occupied by the Grove Hotel, a much more profitable investment, we take it, and very well conducted. The croquet- and tennis-lawns are really beautifully kept.

**Permanent meadows.**—Just in front of our windows, is an orchard of apple-trees that is kept in grass and mown yearly but never grazed. This year, the yield we put, before cutting, at 2 tons an acre, and as the owner says there were 275 bundles to the arpent, we were not far out. The seed, a mixture of timothy, red-alsike and white-clover, was sown 13 years ago, and, though the red-clover has almost disappeared, the white and the alsike are still flourishing. But, oh, dear! the length of time the grass stood before it was thought to be fit to cut! The barn-flour was thick with timothy-seed, good for the horses we suppose, but as the major part of the hay goes to Montreal, the land will not benefit by the severance of the crop. The orchard in question has never received a load of dung, consequently, the crop of apples is usually very poor. (1)

By the bye, people here seem to take no notice of the tent-caterpillar. In many places we have seen their nest, and, permission granted, have

(1) A sadly neglected orchard. Tent-caterpillars abound, and the trees, this year having a fair crop, are breaking down for want of props.—Ed.

entered the orchard and destroyed the vormin; but the farmers ought really to take the trouble to do this trifling job themselves.

**The Horn-fly.**—Pests worrying the cows don't tend to increase their yield of milk. Seeing a small herd of cows suffering torments from the *horn-fly*, we asked the dairyman if he had not seen the recipes for the prevention of the attacks of these brutes. He replied that he received the *Journal d'Agriculture*, but had not observed anything of the kind in it! Of course we gave him the recipe by word of mouth, but we feel certain he won't use the mixture. (And he didn't.)

**Rollers.**—Can't find that any one about Pointe-Claire uses a roller; and yet, on this light, shattery land near the Lake St-Louis, a good heavy roller would be of inestimable value; it would save the grain-crop from losing root-hold, among other things; and instead of the meadows being all holes and lumps whereby the grasses don't get mown off evenly they, if rolled in spring, during their semi-moist state, would present a level surface to the mower, and all those jumps and jars, which too often cause fractures of the working parts of the implement and thereby delay, would be avoided. Chain- or bush-harrowing of meadows is not time thrown away, whatever people who are unaccustomed to the two operations may think, as any one who watched the work at the Messrs. Dawes' farm at Lachine during Mr. Tuck their old foreman's time, would testify.

**Top-dressing meadows.**—The same absurd notion that prevails in too many parts of the country among farmers prevails here: that top-dressing meadows is a waste of dung. It seems to be useless to describe Mr. Shutt's experiment of last year, by which he showed convincingly that dung exposed for months, under glass, to the rays of the sun, lost a mere trifle of its valuable constituents. Neither is of any use to relate that in the best farmed country in the world, meadows are invariably top-dressed with dung at any season of the year that may be found convenient. They know better, they do, and it is a waste of dung to do anything but plough it in.

**Seed-clover.**—The great seed-growers of the Eastern counties of England always feed off their clover and trefoil with sheep up to about the 20th of May, because, if these plants are allowed to grow till they are fit for hay, the seed-harvest would fall too late in the season and the seed would run the risk of being discoloured by rain. If, on the other hand, the first crop were allowed to go to seed without being fed-down, the crop would be irregular and would not all ripen simultaneously.

**Steamed-food for cows.**—Mr. Crozier, a well known butter-dairyman in the State of New-York, has long given up steaming food for his cows. The chief dependance for them is on corn, cut green, cured and chaffed, mangels, bran, and pease. Cows, he finds, produce more milk from steamed food, as we have often observed, but they are not so healthy and their calves when dropped are not so strong. On the mixed food, as above, Mr. Crozier is sure he gets more butter. If he were a milkman, he would steam, as he thinks it increases the flow of milk from 15% to 20%.

**Food and butter-fat.**—Sir John Lawes, we find, holds the same opinion that we hold as to effect of food on the quality as well as on the quantity of milk. His cows are fed as follows: Decorticated cotton-cake, 4 lbs.; bran, 3½ lbs.; hay, straw and chaff, 14 lbs.; mangels, 80 lbs. Average of three months 100 lbs. of food a day; calculated as dry, 22 lbs. Average produce of milk, 30 lbs.; number of cows, 28. "There can be no doubt," he continues, "that if the cotton-cake were stopped, the milk would fall off in both quantity and quality, and that when brewers' grains are largely used, a milk containing a large amount of water and a low amount of fat is produced: fat is increased by rich food." And, speaking of the effect of the very high manuring of mangels and sugar-beets, producing large beets very poor in sugar, Sir John goes on to say: "Unless I had made certain of the fact, I could not have believed that such worthless mangels could have been grown; and for the same reason, I think you might produce very poor genuine milk." Dr. Voelcker, the well known chemist to the Royal Agricultural Society of England is on our side: "You cannot water the milk by giving cows much water to drink; but the case is very different if washy or very succulent food, which is always very watery, and at the best poor and innutritious, is given to cows. Again, if brewers' grains, not supplemented by concentrated food, is given, much but watery milk will be produced. All the constituents—fat, casein, milk-sugar, and ash—vary in cow's milk, but the greatest variation occurs in the percentage of butter-fat," and this, as we have just seen, is affected by the food administered.

**Permanent pasture.**—From the report of the Judges on Agricultural Merit, which we have lately had the honour of translating from the French, we find that many of the competitors have, in addition to the land under cultivation, a large extent of what is called "permanent pasture" in the report. Not having seen any of the pastures, we cannot express an opinion as to their value; but all the pastures of that sort we have met with in the Eastern-Townships, with the exception of those belonging to such farmers as the Judahs, Cochranes, and other men of that stamp, are simply outlying bits of land either too wet or too rocky to be worth bringing under the plough.

There is no earthly reason why land with a cool bottom, land the composition of which is what may be called a middling loam, neither too heavy nor too light, should not, by careful treatment, be compelled to bear a succession of crops of grass throughout the summer.

But, we do not mean to assert that poor sands, like those of Sorol and Joliette, can be converted into profitable pastures. Neither will the worn-out clays in the neighbourhood of St-Hyacinthe, &c., pay for the outlay required. Grass seeds are costly, and the habits of the farmers of most of our counties are so much opposed to the practice, that it is highly improbable that more than a very small percentage of them would possess the resolution to allow a fine, promising crop of grass to be fed off by young stock, instead of letting it grow up and become hay. And yet, the feeding off in its early stage of growth is the only way to secure an early permanent pasture. If the seed-shoot is once allowed to protrude from its sheath, the most permanent of the grasses loses its quality of permanence.

To lay down a field in permanent pasture we advise as follows; no grain crop, but rape is to be sown with the seeds in the following fashion:

**Preparation of the land.**—If you really intend to make your pasture permanent, it follows of necessity that you give the grasses composing it something to feed upon; therefore, they must not be sown on a worn out piece of land. The best plan to be pursued, by those who are in earnest, is to take a field that has been thoroughly cleaned by two hoed and manured crops in succession, and if the manure applied to the those crops had a large proportion of bones in it, it would be none the worst.

After the hoed crops have been harvested, the land should receive its fall-furrow, which should be a pretty deep one, as by that time the double manur-

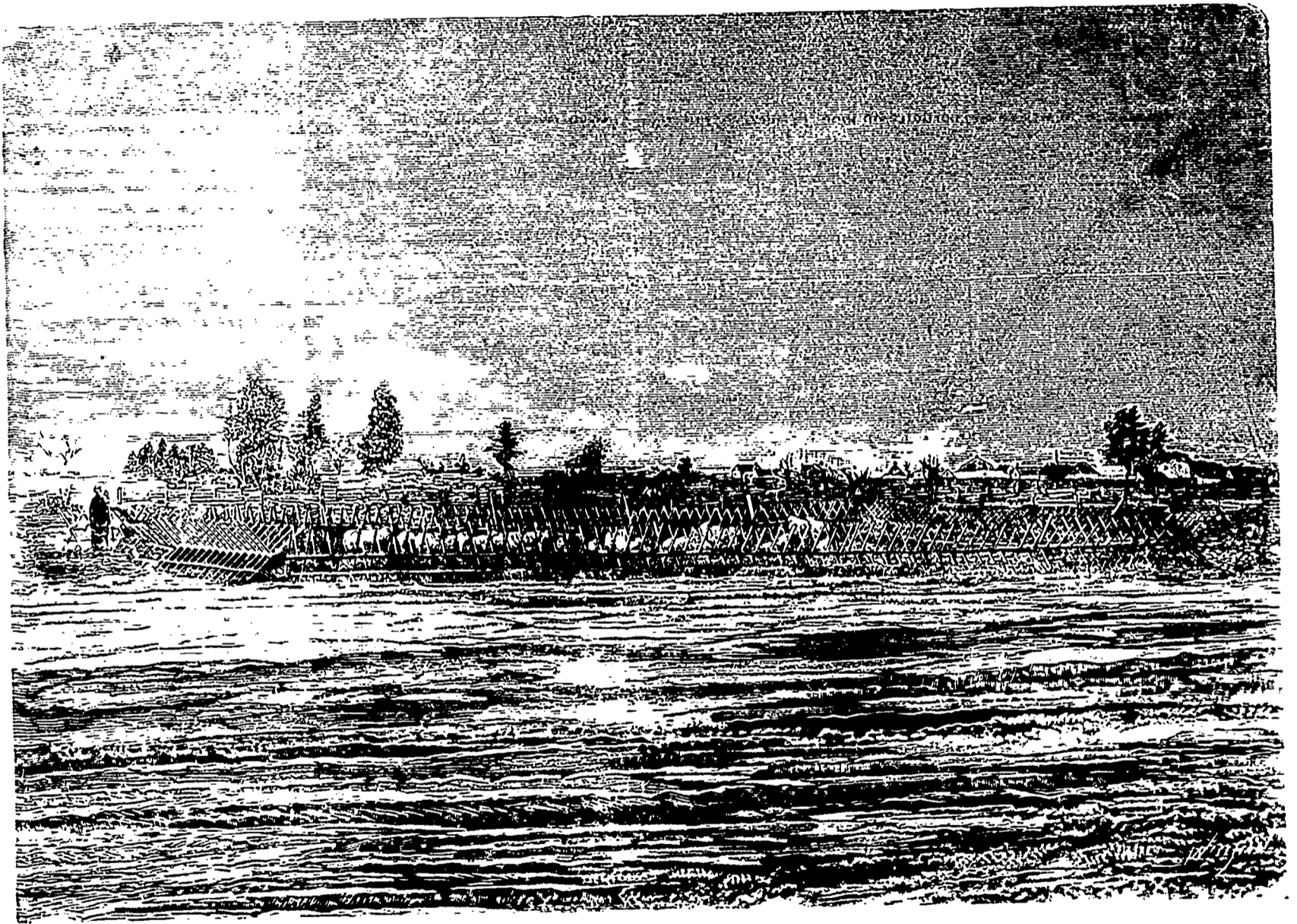
and as thick as it could stand, so thick that if the birds were not killed dead, it was almost impossible to find them without a retriever. This rape was for hurdling off in October with sheep, to be followed by wheat, and very heavy crops of wheat, sainfoin, and oats succeeded without any further manuring. But this, by the way. In the following spring, as soon as the weather is favourable, either in May or June, with sufficient amount of tillage to secure a fine tilth, apply first a thin sowing of rape, or coleseed by which name it is sometimes better known, and after being thoroughly harrowed and rolled, sow the clovers and grasses as we have recommended or, if preferred, the necessary quantities and mixtures may now be had from any of our leading seed firms, and reliable results may be anticipated. As rape

we shall find at the close of the season a thick and luxuriant sward, with all the appearance of several years' standing; in fact, it hastens the growth and shortens the time when the fields so treated may be looked upon as valuable meadow or pasture.

We do not by any means claim for this system that it is original; on the contrary, it has been carried out in practice for years, but it is certainly a matter of surprise that the plan has not been more generally adopted. Having had practical experience of this ourselves in several counties, and under varying conditions of soil and climate we can speak very confidently of its unfailling results. But perhaps there are some suggestions in carrying out this system to which attention should be given, otherwise the good results which we guarantee will, at

a general term, but in this case, we should prefer feeding-off the crop with lambs, as they would not be likely to bite so close as older sheep, and the food would come in very handy for them after they had been weaned a fortnight or so; not sooner, as it might induce scouring, and some dry food, oats and pease mixed, should be given in addition, in troughs, with some clover-chaff as soon as the lambs will eat it, which they will seldom do before the arrival of frosty mornings.

We give an engraving of our fold on rape, at Sorol, 1884. As there were no grass seeds sown in this case, the plough was kept going close up to the fold. The photograph was taken on the 7th December, just as the lambs were finishing the rape. The following crop of oats, Mr. Gustaf Gylling, who succeeded us in the occupation,



A SHEEPFOLD; LINCOLN COLLEGE FARM: SOROL; DECEMBER 7TH.

ing will have assuredly penetrated the two or three uppermost inches of the sub-soil, and there will be no danger of bringing raw material to the surface. Lay the land up as usual in the ridges you find best suited to it: *there is no use in trying to make wide ridges in undrained, heavy clay soils*; our best farmed Essex clays—England—are all in 5 foot ridges. And here I may as well observe that it is quite a mistake to suppose that rape, or cole seed as the Eastern-counties' farmers call it, they are both very similar plants, is a light land plant. In England it is the special plant for heavy clays, too stiff to grow turnips for winter sheepfeeding. On the East Hills, in Kent, where the land is so heavy that no team of less than 4 horses can plough it, we have often shot partridges in rape up to our waist,

generates growth very quickly it will be found ready for the sheep-folding, which we recommend, before the grasses and clovers have got sufficiently advanced in growth for the injury by feeding off, which some have doubts about, and others positively object to; and if the soil is good, and other conditions favourable, a second and even a third folding may be had during the first summer of the repeated growth of rape. No one at all acquainted with farming can fail to see obvious reasons in favour of folding, as every practical man knows that the most important and even essential conditions in the cultivation of grasses and clovers is the thorough consolidation of the soil, and so in this case it is accompanied by a liberal and even distribution of valuable fertilising matter, such as a well-fed flock ensures. As a result,

least, be less satisfactory, and that is not to sow the rape too thickly, (1) and never on any account to close fold during wet weather, particularly where the soil is heavy stiff clay. But with due attention to these, no one need be under any doubt as to the ultimate success of this mode of cultivation. Laying down land to grass with a grain crop we know has been the almost universal custom, but if land is in the high state of cultivation which we would recommend for permanent pastures there is always the danger of an excessive straw crop, which invariably weakens, if it does not destroy the grass, and so incurs both disappointment and loss, which, in these days, has most carefully to be avoided.

When we say sheep-feeding, we use

(1) 4 lbs, an acre will do—broadcast—Ed.

assured us, was 70 bushels to the imperial acre of black oats. The cost of seed and manure for the rape was: seed = 6 lbs. at 12 cts. = \$0.72, and 300 lbs. of a queer sort of superphosphate = \$2.50; in all \$3.22. As the lambs went off quite fat, it was a paying affair.

When the spring arrives, as soon as the land is dryish, bush- or chain-harrow to spread the dung the sheep have left, and then roll with the heaviest roller you can find. Don't mow for hay for the first year or two, but pasture *lightly*, preferably with young stock, and though *lightly*, keep all seed-shoots down; if any seem determined to beat the cattle, mow them at once.

The hurdles in the cut were made of white-pine 4 x 4 inches for the main bar; though 3 x 3 inch stuff would do

well enough; the transverse pieces were  $1\frac{1}{2} \times 1\frac{1}{2}$  inches, and 4 feet long. If the sheep are jumpers, a single wire along the top of the hurdles will soon cure them of the trick by throwing them on their backs. At each of the 4 corners of the fold a couple of short bars should be tied to keep the sheep from creeping out. With this form of hurdle, there need be no tramping down of the food, as the fence can be advanced two or three feet at any time by simply rolling the hurdles over.

Lambs on rape require no water; indeed, if they have water at command they would not drink it, so succulent is the plant.

The manure for rape, when sown after a rotation of crops has pretty well exhausted the soil, is 500 lbs. of bone-dust, 20 bushels of wood ashes, harrowed in before the seed, and, if you like to afford it, 120 lbs. of nitrate of soda, sown at twice, with a fortnight's interval, to the acre. Six lbs. of rape or coleseed (the French *colza*) broadcast to the acre: if hoeing crops were practised here as in England, rape might be set out like turnips, but it will take some time to arrive at that with our men; besides, we contend that, although hoeing produces great growth of stem, the delicate, tender leaves of the broadcast, thick-growing plant is what the sheep prefer.

**Carrot Sowing.**—George.—I intend trying to grow about 2 acres of carrots, and should be glad if you would tell me in your next issue if there is any artificial manure I can apply that would pay? I shall apply 17 to 20 tons of yard manure per acre, and the land is already fairly good, a medium light soil on a red gravelly and sandstone subsoil. Also I should be glad to know if there is any cheap and really efficient machine for sowing the seed in the drills? I have a good turnip drill, but it does not sow carrot seed properly, and hand-sowing is a very tedious operation. [Having sown carrots frequently with the ordinary root drill, we see no difficulty. Mix your carrot seed well with sand, and introduce enough barley to mark the rows. You thus increase the bulk of seed, and prevent its clinging together in masses. Deep cultivation and farm-yard dung, but no artificials. The carrot roots so deeply that it requires uniform fertility to a great depth. You may start them with 2 cwt. per acre of superphosphate. No, we know of no implement specially for this purpose, and we are opposed to the multiplication table as regards implements on a farm.]

**Pease.**—On the 24th July, pease were cut at Beaconsfield: dead ripe and as hard as flints. (1)

**Linseed for veal.**—Butchers, in England, profess to be able to tell whether the flesh of a calf will be white or not by inspection of the upper part of the eye. This is an ancient superstition. Another theory is, that nothing but the pure full milk of the cow will make good veal. This, too, is a mistaken notion, for we have made as good white veal with skim-milk and linseed soup as we ever made with full cow's milk. In fact, we have sold 13 weeks' old calves to a London butcher for five pounds apiece that, after first week, never tasted full milk at all. Why not? All that is removed from the milk by skimming is the butter-fat, and the oil of the linseed

(1) Of course these were "les quarante jours", i. e. 40 day-pease.

replaces that. By linseed, we of course mean the seed of the flax-plant, not the oil-cake. For rearing calves, pease soup may be added as soon as they will take it, beginning with moderate doses, and not omitting the linseed for fear of constipation; but veal calves should never have anything but the linseed.

The seed should be crushed and boiled in water, and the skim-milk must be given at a temperature of about 100° F. Cold milk causes indigestion more frequently than people imagine.

**Lambs in England.**—What a contrast there is in the present and the last season as to keep for stock in England. Last year, the pastures at the end of May were bare, the root-crop was hopeless, as the seed never grew, and the hay was 60% under the average. Lean stock, too, sheep especially, could hardly be given away, and the make of butter and cheese was less than it had been for years. Now, however, though here and there a piece of young clover may have failed, the whole country is full to superfluity of food, in fact, so full that farmers, with their reduced capital, hardly know where to look for stock to eat the produce of their fields. Lambs, that last year only fetched 26s to 28s, are now worth from 36s to 38s, and, only the other day, 150 fine large Suffolk Down were sold by auction at Newmarket for 41s 6d.—just \$1000! There is little doubt that the price of good Down lambs is from 10s to 12s a head higher than last year; but, unfortunately, the price of meat remains about the same as it was in 1893.

**Cows.**—A correspondent of the *Vermont Watchman* has the following on the exercise required by cows:

"The advocate of turning cows out every day for exercise should watch a good cow in a good pasture this summer and see how much exercise, or rather how little, she takes. She will feed far enough to satisfy her appetite, and then go far enough to find some favorite spot on which to lie down and ruminate, but no farther will she go except to seek for drink."

But the writer does not seem to have reckoned the number of times a cow, at grass, feeds during the day, neither has he considered that her food is not concentrated into a small bulk as it is in the winter. The cow at grass is on the move throughout the day and some part of the night, unless the grass is very lush indeed, and gets plenty of exercise while at feed. Not that we are advocates for turning cows out of a warm cowhouse into the open air at a temperature of zero; far from it; but, after all, a cow heavy in calf, would be none the worse for a little exercise when the weather is genial, neither would the foetus suffer. On poor grass-land, such as are most of the pastures we have here, a cow has to take almost too much exercise before she can get sufficient to fill her belly. Why have cows on mountain pastures, like the Western-Highlands of Scotland, deep, narrow brisquets, and shorthorns on the rich pastures of Lincolnshire and Leicestershire, broad brisquets with no great depth?

**Turnips.**—The farmers of the States—there are exception to the rule of course—don't seem to have much notion of growing turnips; e. g.:

Turnips may be planted during July. Use the new crop of seed and have the ground ready. It is better to plant an excess of seed, thinning out, if the plants are too thick,

(1) i. e., July 20th!

as the fly sometimes does damage. With the improved hand seed drills and wheel hoes now in use the turnip crop is not as difficult to grow as formerly. No crop helps out in winter more than turnips as they afford a change of food and promote thrift of the stock.

"An excess of seed"! Why, two ounces of seed would more than furnish, if every seed grow, all the plants on an acre of land; and, yet, we ourselves never sowed less than 2½ lbs. of white-turnips and 3 lbs. of swedes. Mr. James Drummond sows 4 lbs. of swedes, as do many good farmers. The fact is, that the States' people know nothing about turnip-growing, and it would answer their purpose to import a few hundred Scotch or English turnip-hoers to teach them how to set out the plants, as well as it would pay us Canadians to import a few drainers to teach us how to dig out drains and lay the pipes before we spend money on what may, and probably will be, utterly useless. Making a ditch, is one thing, making a 4 foot drain, is another.

**Robertson's mixture.**—As we were looking round the farms in the Valois district on Sunday, August 5th, we were mightily struck with a piece of sunflowers, and immediately jumped to the conclusion that where that plant was growing, horse-beans would be found not far off. We were right; Mr. Crane, the owner of the farm, is now, for the second time, growing Professor Robertson's mixture for the silo: maize, horse-beans, and sunflowers. The maize and sunflowers look well but the beans are a failure as regards pods. The insect plagues have devoured the blossoms as fast as they formed, and we doubt, if they were to ripen, if there would be 8 bushels to the acre of seed.

The reason of the failure of the beans does not seem to us to be difficult to discern. According to the information we received from one of the men employed on the farm, they were sown late in June, so that when the summer-brood of fly was in its full vigour, the beans were just coming into bloom, and suffered irrecoverably from the attacks of the vermin. Whether for seed or for silage, beans should be sown as soon as the ground is dry enough to work. They are perfectly hardy, but no plant is so subject to attacks from the fly in its blossoming stage, and therefore that stage should be advanced as much as possible, so as to take place before the pest is abundant.

Our guide (who was mistaken, I hear from the foreman) mentioned that, in the silo, the heads of the sunflowers spoiled all the maize and beans in their immediate neighbourhood, turning the silage black! Have any of our readers found them injurious in this way? Maize, very fine, but rows too close together.

A lovely spot Mr. Crane has chosen for his abode. The plantations round the house display great taste, and liberal expenditure in the purchase of foreign trees. The *Russian alder*, with its brilliant, deep scarlet berries, on a dwarf semi-weeping tree, is particularly attractive at this season, though we fear its beauty is but short-lived.

The potato crop in this neighbourhood is very good and, as far as we can see and hear, there is no sign of the disease. Many of the Early-Roses are quite ripe and some have been already (August 10th) dug and stored.

**Double crops.**—A most industrious old couple, Pilon, by name at the

corner of the road turning up from the lake to the Beaconsfield station, have a garden of about an arpent that is about as full as it can hold of every sort of produce from a *gladiolus* to an onion. Among other things we saw, one particularly gladdened our eyes: as fast as the potatoes were dug, they sowed turnips in their place. From fifty to sixty pounds of tobacco are usually produced, which, from peculiar skill in its manipulation, sells for 20 cents a pound over market price. Two large barrels were full of some dark materials in a state of fermentation, which, I found upon inquiry were black-currants and white-sugar, destined to produce wine; which we hope and trust will be all sold before we see it again, or the hospitality of the makers will infallibly lead them to invite us to taste it, and we would rather not: ough!

**Maize.**—So the corn-crop is a failure in many of the great maize-growing States! Well, that will make our barley and oats more valuable.

**N. W. T.**—Sad news from the North-Western-Territories. Regina and Moosomin are reputed to have no crop at all, and petitions are being prepared to induce government to come to the aid of the farmers of those districts.

**Green Manuring.**—A history of the practice of green manuring, by J. Kuhn, in an official publication in Saxony, bears the conclusion that green crops can be used more economically in feeding for meat and milk than in plowing under merely as a manure. It is assumed that the search for a profitable crop for green manuring of the better class of soils is without avail. But the plowing under of the stubble or remains of a crop is proper and profitable. It is held to be a mistake to plow into the soil for manure a pound of albuminoids which could be used for making flesh or milk. The practice makes no headway in farm management, except with lupines on light sandy soils. It is recommended to take advantage of recent discoveries in agricultural science, and instead of manuring the soil with atmospheric nitrogen, utilising to the fullest extent the nitrogenous and carbonaceous materials derived from the air by feeding them to farm animals.

We have sown our first scarlet clover. It was sown in the standing corn, and stirred into the ground with the cultivator. Scarlet clover seed is so large it seems to me it is better to be covered. Scarlet clover is now here. What great things may come of it if it is successful! We need no longer be tied to wheat raising.—*Country Gent.*

Well, with us in England, crimson-clover, *trifolium incarnatum*, never succeeds on stirred ground. It is sown on wheat stubbles, immediately after harvest, and simply harrowed in—hardly covered at all—and then rolled. As it rarely succeeds in England north of Shropshire, it is not likely to stand the winter here.

Ground bone is not only an excellent food, but it is also very cheap. In this vicinity only 60 cents per hundred; and doubtless still cheaper in other sections. With liberal feeds of bone and clover, hens lay remarkably and pigs grow wonderfully.

M. SUMNER PERKINS.

Danvers, Mass.—*Country Gent.*

Can ground bones be got in Massachusetts for \$12.00 or even \$24.00 a ton?—Ed.

## CIDER-MAKING.

(By the Editor)

There is a good deal of cider made in Canada and in the New-England States when apples are plentiful. Very little is good for much: it is either mawkishly sweet or as sour as verjuice. We never taste the fine dry cider—more like a wine than anything else—our Gloucestershire tenants make, a couple of pints of which will seriously affect a man's temperament. We were immensely amused on our arrival in Canada, just 36 years ago to find that cider as a drink was permitted to the most rigid teetotaller! Well, the cider, we soon found, was pretty harmless—there had been precious little sugar in the fruit originally, and, therefore, very little alcohol had been formed, and the greater part of what had been formed was converted into vinegar by a bad system (there was no system at all) of fermentation. Cider won't make itself any more than wine will, and according to the treatment and care it meets with will be its quality. It is either delicious or horridly bad.

Now our Gloucestershire and Herefordshire men deal with the fruit after this fashion:

**Gathering the fruit.**—Men beat the trees with long poles, which are sometimes armed with an iron hook to enable the labourers the better to lay hold of and shake the branches of the trees. The apples are gathered into baskets, and placed in heaps to mellow remaining in the heap from three to five weeks. If the fruit is kept too long, good cider cannot be made from it, as some of the apples will be rotten. If, on the other hand, time is not allowed for mellowing, the conversion of the lignine, or woody fibre, into sugar will be incomplete (1).

**Crushing, pressing, &c.**—After crushing, the flavour and quality of the cider is much improved by leaving the mass of fruit for twenty-four hours before pressing. Some aroma is evidently formed from the contact of the bruised skins and pips. The juice from the press is put into casks filled to the bung hole, which is left open, and in a few hours fermentation commences, on the due management of which the subsequent strength and quality of the cider depends. The expressed apple juice, as it issues from the press, is a turbid, brownish liquid, luscious and sweetish to the taste, but far from inviting in appearance. The coarsest of the impurities speedily become separated from the body of the liquor, being partly discharged in the form of scum, which issues through the bung hole along with the first yeast which is discharged, and partly as a thick sediment which gradually settles to the bottom of the cask as the activity of the fermentation subsides. When the cider becomes clear, it is racked into another cask, and, generally speaking, no further trouble is taken with it. Here, then, is the grand error, falling into which, half, or more than half, of the

(1) We have no analysis of apples to prove this, but Berard's analysis of pears will serve to show what an immense difference there is between fruit ripe from the tree, and fruit in a proper mellow condition. He examined Beurre pears in three states—1, ripe and fresh; 2, kept till mellow; 3, kept till brown or beginning to rot. (Sugar, 6.45, 2.11.52, 3.8.77), showing, clearly, that n° 2, when converted into perry, would contain, if properly managed, about 80 per cent more alcohol than n° 1, and the same holds proportionally good with apples, though they do not contain quite so much sugar as pears.

cider made in this country is spoiled. The fermentation goes on, or rather, a secondary fermentation is set up, and continues as long as any sugar remains to be converted into alcohol.

**Racking for sale etc.**—Now, for commercial purposes, it is generally considered desirable to retain a considerable amount of sweetness in the liquor. This may be done in two ways; by repeated racking into fresh casks; or by sulphuring.

**Sulphuring, or matching.**—Matches are made of woollen or linen cloth, a few inches long by an inch wide, and are thickly coated with sulphur by repeatedly dipping them into that substance when heated to liquidity. Having stopped closely every vent in the cask except the bung-hole, light the match, and lower it into the cask, holding the match by the end, which should be free from sulphur, until well lighted, when the bung should be driven in, the cloth being wedged in between the bung and the stave. The rationale of this proceeding is clear enough: sulphurous acid is formed, rendering the soluble gelatinous matter present insoluble, and arresting the fermentation and consequent decay of several of the essential oils to which the flavour and aroma of the cider are due. In fact, it acts in the same way as the tannin of hops acts on beer.

As our own people do not care for sweet cider, but prefer a dry liquor, (1), they seldom match their cider; it is racked into fresh-washed casks two or three times, and at three years old, is much more like the pure sherry one gets in Spain than anything else—it is as dry and as nutty-flavoured as Amontillado. A triling quantity of caramel, or burnt sugar, is used for colouring.

The strength of cider is dependent, in the first instance, on the quantity of grape-sugar (glucose) contained in the expressed juice—nothing but sugar can be converted into alcohol by fermentation. If, owing to a bad season, it is found deficient in sugar, glucose from the corn-works might be added to the juice: just as our experimentalising wine-makers are doing with their must. But this will seldom be found necessary, as a plentiful apple year is generally a sunny year, and it is only when the fruit is abundant that any quantity of cider is made here.

It will be observed that fermentation in this, as in the treatment of all alcoholic liquors, is the main point to be studied. Let us see, then, what this fermentation is, and what its effects are:

The spontaneous fermentation which occurs in the saccharine juices of fruits, such as grapes, apples, pears, etc., is due to the presence of certain azotised compounds—azotised meaning, of course, containing nitrogen. Fermentation can only be excited, in the first instance, in the presence of oxygen—i. e., in atmospheric air which contains oxygen. When once begun, it will continue until the whole of the sugar is decomposed, although further admission of the atmosphere be prevented; alcohol and carbonic acid are formed during the process, and yeast is also produced. Now yeast, once brought into existence, is not only able to convert the remaining sugar into alcohol, but, from its power of absorbing oxygen, will change the alcohol into vinegar. Here, then, we are led to see the wisdom of carrying on all fermentation in close vessels, as recommended in M. Chagnis, article on wine-making: a reversed pipe should be fitted into the

(1) See in French.

bung, with its end in a vessel of water allowing the escape of the carbonic acid which is evolved during the process, and preventing the entrance of atmospheric air.

In musts, like the grape, juice, skins, etc., a large amount of sugar and a very small quantity of nitrogenous compounds are present, consequently, the decomposition of the latter is completed during fermentation, and their separation in an insoluble form is effected previous to the conversion of the whole of the sugar into alcohol and carbonic acid. Rack the liquor carefully from the lees, and wine thus treated will keep for an indefinite period, in fact, if the atmosphere could be excluded, it would keep for ever, and in any temperature, as M. Pasteur has clearly shown in his great essay on fermentation. In practice, however, the air cannot be excluded, and besides, as many an owner of "bonded spirits" finds to his loss, alcohol is able to escape through the staves that form the containing vessel.

Our readers will now understand why cider, in spite of numerous rackings, undergoes so many fermentations: the juice of the apple contains a proportion of nitrogenous compounds, susceptible of being converted into ferment more than sufficient to change the whole of the sugar present into alcohol, and in cold summers this undue proportion is increased, consequently, sugar should be added to the juice whenever this excess is even suspected. Champagne is often found to be what is technically called "ropy," or in common parlance, viscid, owing to the mutual action of sugar and the gelatine used for finings. The cure used in France for this disease is, we believe an infusion of oak bark, or tannic acid in some shape: this throws down the soluble nitrogenous matters in the form of an insoluble flaky precipitate, and, when carefully racked, the wine is fine and safe to keep. This might be tried with cider, and, we think, with success, as it is beyond doubt that acidity is purely owing to the presence of this excess of nitrogen.

We have mentioned before, in talking of wine, the curious fact, that the apple sweetest to the taste does not contain the ultimate amount of sugar afforded by some fruit which is almost bitter to the palate. The "Storo" (austere?), which yields the strongest and finest flavoured cider, is almost unpalatable, and so is the celebrated "Cochalagee"—the spelling of which word is probably incorrect, as we never saw it in print. But if the analysis given above is correct, the probability is that, in what we call dessert fruit, the chief conversion of the lignine, etc., into sugar, which in the cider-fruit takes place after gathering, is completed, or nearly so, on the tree. As a general rule, two measures and a half of apples will make one of cider.

## DEPARTMENT OF AGRICULTURE

AND

COLONISATION, QUEBEC.

Quebec, June 23rd, 1894.

H. FRASER, ESQUIRE,

Secretary of the Eastern  
Township,

Agricultural Association, Sherbrooke.

Sir,

I have the honor, under instructions from the Honorable the Commissioner of Agriculture, to inform you that out of the grant of \$4,000.00 pro-

vided by the department in order to aid your society in the offering of prizes at your next exhibition at Sherbrooke, the Commissioner desires that (\$300.00) Three-hundred dollars be offered for special prizes, as follows:

Four prizes: \$30, 20, 15, 8,

For the best entire herd of not less than eight milch cows, such cows not to be on exhibition, such herds to be judged only by their actual production of milk, for the full space of three months, viz: June, July and August 1894. The quantity of milk and its production of fat to be established by a legal declaration, from the maker of butter or cheese, at the factory where such milk is delivered.

All competitors must hand over to the secretary of the Eastern Township Agricultural Association, on the opening of the exhibition, with the above mentioned certificate, number of cows, quantity and quality of milk production etc., a paper on the feeding and care given to such herd, to their pastures, what green food is supplied them, if any, and also care and mode of feeding in winter, as well as in summer. A description of stables, their special point as to heat, light, ventilation, care of manure, must be given, as well as a description of the facilities for feeding and watering etc. Such paper must be short.

Four prizes for pigs: \$20, 15, 10, 5.

For the best pen of thorough-bred pigs, any one breed, one male and two females; such pens to be judged not only for their intrinsic merit, but also by the best paper on the care and management given, by the owner thereof, to the pigs exhibited. Such paper to mention also the mode of feeding and caring for pigs, in winter and in summer, describing his own pig sties, their special points as to ventilation, heat in winter, care of manure, facilities for feeding, etc.

Four prizes for sheep: \$20, 15, 10, 5.

For the best pens of sheep, of not less than five head, such pens to be judged not only for their intrinsic merit, but also by the best paper on the care and management given, by the owner thereof, of the sheep exhibited, their pastures and care, their preparation for sale, quantity of butcher's meat, and wool obtained etc., the profit derived from such flocks, how wintered etc., etc.

Four prizes for mangel wurtzels or fodder beets: \$15, 12, 8, 5.

For the best two bushels field beets for the feeding of cows, such beets to be taken out of a field of not less than ½ acre with legal certificate to that effect, such prizes to be given not only for the intrinsic merit of the beets, but also for the best paper, by the exhibitor, on the cultivation of beets, quantity of seed sown, how cultivated, giving estimate of yield per acre, and also rotation of crop preceding such culture in the field where grown; how fed, and profit obtained from such feeding.

Four prizes for fields carrots:

\$15, 12, 8, 5.

For the best two bushels field carrots for the feeding of cows, such carrots to be taken out of a field of not less than ½ acre, with legal certificate to that effect, such prizes to be given not only for the intrinsic merit of the

carrots, but also for the best paper, by the exhibitor, on the cultivation of carrots, quantity of seed sown, how cultivated, giving estimate of yield per acre, and also rotation of crop preceeding such culture in the field where grown; how fed, and profit obtained from such feeding.

### Three prizes for corn silage:

\$15, 12, 8.

For the best four bundles of not less than ten stalks in each bundle of silage, corn grown on field of not less than four acres, giving estimate of tons per acre with legal certificate to that effect, such prizes to be given not only for the intrinsic merit of the corn, but also for the best paper, by the exhibitor, on the cultivation of ensilage, quantity of seed sown, how cultivated, manner of putting in silo, feeding and profit obtained from such feeding.

All papers prepared in connection with special classes for herd of cows, for pigs, sheep, field beats, field carrots and corn ensilage must be handed over to the secretary of the Exhibition at its opening: they must be short, so as not to exceed one page of the *Journal of Agriculture* when printed.

The commissioner would be pleased himself to select and appoint two of the judges to act in the granting of the above named special prizes and to obtain the original or a certified copy of all such papers, as above, as soon as possible after your exhibition, so as to have them printed without delay.

You will oblige me by submitting these requests to the directors of your society at their next meeting and advising me at your earliest convenience if they be accepted by the board, so that mention be made of the fact in good time in our *Agricultural Journal*, French and English Editions.

I have the honor to be,

Sir,

Yours very truly.

(Signed) G. A. GIGAULT,

Assistant-Commissioner of  
*Agriculture and Colonisation.*

### ECONOMY IN LABOUR.

Much may be done to economise labour by system and by the use of light and easy-working machinery. Labour includes all descriptions of power. It is not only manual, but horse and steam power. A study of piecework and of labour organisation, or arrangement, would no doubt cause a reformation in the apportionment of labour on many farms, and an important saving during the year.

### ECONOMY IN FOODS AND MANURES.

While farmers continue to purchase their foods and manures upon the *ipse dixit* of the seller, they will be liable to fraud and excessive charges. We appear to require protection from many other enemies besides the foreigner. There is the civil war which is always being waged between the middleman and the farmer. In this contest the farmer stands at a fearful disadvantage, because the buyer of his goods is always buying, but the individual farmer is only an occasional seller. On the other hand, in the matter of cakes and manures the merchant is always selling—every day, every hour—but the farmer only ventures on the very thin ice of the

market at intervals. Whether as a buyer or a seller, the farmer is fleeced. As buyers we must demand some positive guarantee as to value, such as analysis only can supply. As sellers we must beware of rings, middle profits, and dishonest depreciation of values.

### ECONOMY OF THE WEIGHBRIDGE.

We are convinced that as a protection against the cunning of butchers and dealers, all animal should be sold by live weight.

The farmer is pitted against men who are driving bargains all day and every day. He is exposed to "rings," and to operators who are using every effort to buy as cheaply as possible without magnanimity or scruple. The weighing machine for cattle is as necessary as the measure for corn. To offer a bullock at £22 to a butcher who straightway offers £17, and tries to make the seller ashamed of himself for asking too much, is not business. Not even the best judge can tell the value of a bullock, and it would be as reasonable to take a corn dealer up to a heap of wheat on the floor, and ask him a price for the lot, as it is to ask a price for a lot of fat bullocks on a market. The thing is palpably absurd, and yet it remains the usual practice.

The weighing machine is of vast importance to farmers. Every homestead should be fitted with one capable of weighing cattle or cartloads. If this is thought too ambitious, probably all would agree that every market should have a proper means of weighing cattle, sheep, and pigs, and that its use should be encouraged to the utmost.

J. WRIGHTSON.

### MONTREAL HORTICULTURAL SOCIETY

AND

Fruit-Growers Association of the  
Province of Quebec.

### STRAWBERRIES.

(Continued from page 125.)

Montreal 11th August 1894.

The successful cultivation of the strawberry requires a new plantation to be set out each summer; or as early as it can be accomplished properly. A piece of land that has just been cleared of early potatoes and which has had the benefit of clean culture, will be found a good place to select; that is, if all the other requirements are favorable. The choice of varieties is of importance; and to do so it will be found necessary to experiment on this line and choose the varieties which succeed the best. When the varieties have been selected for the future plantation the proper care in making good is to be first considered. The writer has found it a very good plan to treat all the layers or runners just as he would a batch of cuttings. In doing this it is advisable to prepare the cutting or nursery bed for the reception of the runners making up a suitable compost of rich friable soil for this reception. This nursery bed is better placed on the level and a hotbed frame placed over it to shelter the plants from side winds; covering them after planting with frames (the size of the sashes), covered with cheap unbleached calico. This serves the purpose of shade and still allows sufficient light while the runners are getting their roots established. The runners may be sort-

ed, placing all the good and well rooted ones together and making another batch of those which have no roots or very small ones. It is well to allow two or three inches of the runner stem to those without roots for the purpose of firming into the soil. The distance advisable for this operation between the plants I would recommend four inches apart each way for the well rooted ones, and three inches apart each way for those scarcely or not rooted. To keep them sufficiently watered and close will be all that is required until they show signs of taking hold of the soil by making new leaves when it will be advisable to gradually harden the plants by giving them more air. In about three or four weeks they will be sufficiently hardened off to allow the removal of the cotton frames. Some of the larger and better plants will be established sooner, and can be exposed as soon as they can stand the removal of the shading without becoming wilted. This plan I consider preferable for home propagation to the potted system as it conserves your efforts and you can raise a far larger number of plants with less labor. The plants too are better, as they suffer no check such as potted plants do when they become pot bound at the roots. When a sufficient stock of young plants has been obtained, attention should be at once given to the ground they are intended to occupy; in having it prepared in the best possible manner. This operation cannot be performed too thoroughly, as every ploughing and cultivating especially at this season is improving the land operated upon to an extent perhaps realized only by the few. The opinion of the writer is that a well worked piece of land with out manure will give better results than a poorly worked piece of land with manure; but here as in most other instances both are better and are both highly recommended in strawberry culture. After the operations of ploughing, subsoil-ploughing, and harrowing, the manure should be applied to the ground and evenly spread all over; pass the cultivator both ways, and harrow thoroughly until the soil and the manure (which should be the best and in the best rotted condition) be thoroughly incorporated together. The mechanical condition of the soil is being brought about right also, as the strawberry likes a firm soil to grow in. The roller may then be passed and planting out on the first favorable opportunity, which would be just before rain if possible. Do not work on this piece of land at any time if the soil is too wet, by doing so you are not studying your own interests. Planting out just before rain has the advantage every time.

In planting out it is a good plan to use a marker and the distance I would recommend between the rows, is two feet; and one foot between the plants in the rows. I do not recommend horse culture; after the place has been properly prepared, hand culture will pay after. There is so much ground in a manner wasted with horse culture that the extra crops raised on the same space will go far to pay for the extra expense. I would recommend to plant three rows and miss the fourth; sowing corn on the fourth row the following spring. The row of corn will be found of advantage by shading and sheltering in summer and winter. The corn row space can be utilized the following spring in applying the soil as top dressing between the plants in the three rows. This top dressing is an advantage as the strawberry plant is inclined to make a little stem, rising above the ground, (in fact doing as

many have done before them) getting a little above their business. This top-dressing is thus an advantage as a great many of the principal roots are very near the surface. This is an additional reason for hand culture, as it is not easy to cultivate with a horse cultivator without destroying lots of roots.

The second year's crop is the one that pays; and it is not recommended to keep it longer consequently the necessity of an annual plantation being put down.

### Household-Matters.

A few hints worth remembering: Never visit a house where there is sickness, till you have found out the nature of it.

Why run into danger without making every enquiry as to the nature of the disease?

If this was oftener done, many a malady would be suppressed on the first outbreak.

It is quite unnecessary to see a sick person to show them a kindness; a bunch of flowers, or a tempting little dish, of some sort, will show kindness of heart, and be appreciated by the patient far more than a visit.

The flowers will be a source of pleasure to look at for days, and the dish might prove an inducement to the weakened appetite.

Thus, at least you will show neighbourly sympathy, and a wish to do what you can, and still have saved yourself and family from contagion, while no one could say but that you have done your duty.

Things worth knowing.—For apoplexy raise the head and body; for fainting lay the person flat.

Suck poisoned wounds, unless your mouth is sore; enlarge the wound, or, better still, cut out the part without delay. Smother a small fire with a carpet or anything handy, but never throw water on burning: oil it will only spread it about.

Oatmeal Bags for the Bath.—Oatmeal bags used in the bath give a velvety softness and whiteness to the skin. Take five pounds of oatmeal, ground fine, a half pound of pure Castile soap reduced to powder, and a pound of powdered Italian orris root. Cut a yard of thin cheesecloth into bags about four inches square, sewing them on the machine and taking care not to leave any untied threads, where a break may let the contents ooze out. Mix the soap, oatmeal and orris root thoroughly and fill the bags loosely, sew up the opening in each and lay them away to use as required. They are used as a sponge, dipped in warm water, making a thick, velvety lather and wonderfully softening the skin, while the orris imparts a lasting fragrance.

Marking Linen.—According to authoritative statements, the French or raised satin stitch is now considered the right thing in marking linen. In most cases pure white is to be used, though in towelling a tinge of red may be employed, and where colored articles are to be marked such shades are allowable as will blend harmoniously with the main colors. The tendency now is to quite large letters; but this is doubtless a temporary fashion, and the thoughtful housekeeper can well be a little conservative.—*Good Housekeeping.*



No woman likes the thought of growing old. It means so much. The giving up of pleasures and pastimes that were at once her occupation and delight, and when laid aside she takes up nothing instead. The way to be young is to keep young. Think pleasant thoughts. Do kind acts. Keep all your muscles in action, for as long as they are yours they should be properly exercised. Live at peace with the world and in touch and sympathy with your neighbors. Gather bright young lives about you, and find your pleasure in giving pleasure to others. Do not neglect your health. Give yourself plenty of time for sleep, and above all, cultivate the nerves until you have them in complete subjection. Dress becomingly, and never be influenced by what disinterested persons tell you of the becomingness of certain articles of dress for a "person of your years" or "advanced in life." Make up your mind to keep young, and you will succeed. R. N. Y.

The hat is made of stout linen, the crown is buttoned on to the rim. It can be bought at a very small cost.



This very pretty little cloak, will answer nicely for a child of 3 years or so, made up in cream cashmere, with a broad collar of lace it will suit even a baby just walking. I have seen it made in green cashmere with a square



yoke, and sleeves of black silk, with a broad collar of cream lace, and it really was exceedingly pretty. It is so simple to make, as the skirt part is quite straight with a broad rim at the bottom, and a narrow braid just to cover over the stitches, gathered on the top so as to form a little frill of about a quarter of an inch. The dress from which this measure is taken wants a width and a half of 40 inch goods, the length was 28 inches not allowing for hem. In a house there is often part of dress left over which will always work in for a little dress.

**Vegetable Stew, or Hotch-Potch.**—A beef bone, with 2 or 3 pounds of fresh meat, veal and mutton, will give a nice flavour. Put this into a pot, and cover well with water, let this simmer for a little time, and then add as many vegetables as you can get, onions, carrots, turnips, about one quart of green peas, a good bunch of parsley, tied up, if it is not liked to be eaten and taken out before serving up.

A stick of celery, if in season, if not, celery salt will do as well, and greatly improve the flavour. Stew the meat and vegetables together, but should the meat be cooked before the vegetables are done, take it up and, put it back in the pot just before serving up. As a rule, the whole will be cooked in about the same time. A little pepper and salt, to the whole; should you wish to make a soup of this, you have only to add sufficient water, about 2 quarts at first, and your friends will say, as mine did: why did you not make more of this delicious dish?

**Short fruit Cake.**—3 Cups of flour.  
1 Cup of butter.  
1 Cup of sugar.  
3 Teaspoonfuls of baking powder.  
Sift flour and powder together. Add the sugar, rub the butter into the whole, mix all together with fresh milk into a stiff paste, bake in layers, as jelly-cake, and while hot put jam of any sort between. Eaten hot with sweet white sauce, with a little wine flavouring it makes a very good dessert.

**Currant Jam, black, red or white.**—Let the fruit be very ripe, pick it clean from the stalks, bruise it, and to every pound of fruit, put 3 quarters of a pound of sugar; stir it well and boil for half an hour.

Skim off any scum that may rise to the top. It is better to put it into small jars or glasses.

**Tomato sauce; to be eaten hot or cold.**—One peck of tomatoes  $\frac{1}{2}$  a peck of apples;  
 $\frac{1}{2}$  a pound of sugar, 3 large onions;  
 $\frac{1}{2}$  a pint of vinegar; of salt, pepper, and mixed spice one teaspoonful each. Scald the tomatoes and skin them, peel the apples, and onions, and cut them up a little. Boil the tomatoes, apples and onions till they are soft. Now add the vinegar and spice, and just give a boil up, pass the whole through a colander. It must be quite thick when finished, so much so as to be able to take it on a fork, do not boil this in a tin vessel, but in a porcelain pot.

## Poultry-Yard.

INTRODUCTORY—JULY CHICKENS AND LICE—HOT WEATHER AND SHADE—GROWING CHICKS SHOULD BE PUSHED—CARE OF THE MOULTING HENS.

A. G. Gilbert.

In my last letter I promised to give particulars as to the development of a number of cross-bred chickens hatched out at the Experimental Farm during the months of May and June last and to which I have given particular attention. As the chickens have not attained size sufficient to permit of satisfactory conclusions being arrived at just now, it may be well to leave them alone for the present. There is

one exception, however in the shape of a cockerel of the Barred Plymouth-Rock Coloured-Dorking Cross which has so far made a development of one pound and a quarter per month. And it promises to do even better. The Plymouth-Rock male and Coloured-Dorking female were used. It may be remembered that a cross of his kind was recommended in a previous letter with the view of making a still better market fowl of the Plymouth Rock. A pound and a quarter per month is very satisfactory gain, and it has been attained by no treatment, feed, or attention that a farmer cannot give his chickens. In raising chickens, particularly for Experimental purposes, I do not believe in pampering them, but I certainly believe in—and strongly urge—every care and attention being given, so as to force them to a rapid growth as possible. On another occasion I may enumerate certain rations which have been found most conducive to the rapid and healthy progress of the young stock. Before leaving this subject it may be well to repeat what has been said before, that the farmer should bear in mind that the young chick requires great care and frequent and regular feeding during the first four or five weeks of its existence. Indeed, a chicken allowed to become stunted during the period mentioned will never make a good market-fowl. No subsequent care will make amends for neglect during the period of tender age.

### JULY CHICKENS AND LICE.

Is it a fact that chickens hatched in July do not thrive as well as those brought out in May or early June? Our experience goes to prove that they do not, and an experience of 12 to 14 years leads to the conclusion that no chicks hatch better, or make better progress than those hatched in the latter part of April or early May, or in time to be put on the first and early grass. It is, of course, understood that I am speaking of chickens hatched out by hens. Where an incubator and brooder are used it is optional with the operator, after his eggs are properly fertilised, whether he will have his chicks out in late February or March, or at such period as the exigencies of his market make him the most profit. But until incubators and brooders come into general use, the great majority of farmers will utilise the old hen, and it is from farmers using the latter that I have recently received a number of letters asking what is the cause of the great mortality among their chicks hatched late in June or in July, and this is the reason why I give the subject a place in this letter. In one case a correspondent writes: "I had ten chicks out of 13 eggs and all seemed to do well until they began to droop and die. Now, I have only 3 left. Can you tell me what was the cause of death?" Another correspondent writes: "My chickens were hatched in the early part of July and were apparently all right. They were well fed but began to droop off and now I but a few left." Another says: "I had a lot of fine chicks, but lately many of them seemed to have lost all desire to move about, their wings droop and they die a mass of feather and bone."

In my Experimental farm reports of three or four years ago, I took strong ground against the hatching of chicks in July on account of the difficulty attending the rearing of the greater number to maturity. The chicks, I found, were too tender to stand the fierce rays of the sun, and if they did pull through, those of the

Asiatic and American classes were hardly feathered enough to stand the chilly rains and winds of the fall. Again, the July chicks seemed to be the special object of attacks from lice. In the case of my first two correspondents, it may be that lice had something to do with the loss of their chicks, but there can be no doubt as to the cause of death of the chickens of my third correspondent. No symptoms could more plainly announce the presence of lice. Indeed, lice on chicks, or on hens, cause the victims to present the symptoms of almost every disease poultry are subject to.

The cure is to rid both the mother hen, and her brood, of the vermin by the judicious use of insect powder. A good plan is to rub the skin of the hen under the feathers of the breast and wings where she nestles her young, with a cloth dampened with coal oil. The cloth must only be damp not wet. Apply insect powder to the other parts. The chicks should be carefully dusted with Dalmatian insect powder. If the large gray louse is suspected of having a lodgment in the head of the chick, a drop of oil, or a very small quantity of grease rubbed into the down on the head, will get rid of the obnoxious tenant. It is safe to say that fully seventy-five per cent of late hatched chickens die from lice during the warm season. The coops, in which mother and brood are confined, require to be kept scrupulously clean.

Where it is unavoidable, the chicks hatched in late June or July require plenty of shade; a regular supply of cool drink water or milk, and to be kept free from lice.

Mr. Bovan a writer in the *Poultry Monthly*, a leading poultry journal, says a great deal in the following: "Look out for lice this hot weather. In the houses, in the coops, on the bodies of the fowls and chicks, and, if not kept down, perhaps on yourself, they will swarm. Kill them: Fight them with all your vigour. War to the knife and no quarter given, be your motto. Plenty of lice means few chickens and poor ones."

In the hen houses, coal oil liberally applied will quickly rid them of lice. You should see to it that your laying stock goes into winter quarters, not only free from lice but with their quarters also free from the pests

### PUSH YOUR GROWING CHICKS.

The growing chicks should be pushed with generous feeding. Liberal rations, mean fat cockerels, for your own use or for sale to a good customer, and early laying pullets. The half starved pullets drag out a miserable existence during the fall weather and do not lay in early winter as they should, and if not better fed and comfortably housed will not lay at all. A half starved cockerel will never fetch a tip-top price.

### CARE FOR THE MOULTING HENS.

The moulting hens should be well fed. All the old hens should be killed off, after being fattened. If the growing pullets and yearling hens are well looked after now, they will all be layers when eggs are getting scarce and high in price. The aim should be to have your pullets begin to lay in November or December and if they have hatched out early they will do so. By getting your hens early over their moult, which can be done by proper rations, they will be layers in early winter. A yearling, or a two year old hen; ought to beg into lay in early winter and continue to do so throughout that season. In order to obtain

that result pay attention to your fowls, now. No paying result can be obtained, in any line of business, without intelligent and systematic effort. Poultry is no exception to the rule.

I have several correspondents who make 35 to 40 cents per dozen, wholesale, from their eggs during winter by selling them to Montreal dealers, and the reader of this can do the same by a little energy and a knowledge of the proper methods.

Ottawa, 13th August 1894.

## SUCCESSFUL TURKEY RAISING.

*All About the Care of Turkeys from the Egg to the Table, by a Successful Poulterer.*

### SECOND PRIZE ESSAY.

How shall I make a start! Buy a trio of turkeys, a tom and two hens, or purchase eggs and set them under hens. My experience favors the former, and three turkey hens will give better results with but little more outlay and care. The extra expense of turkeys over eggs will be amply repaid before the laying season is over. Purchase the stock from a reliable dealer. The tom and hens should not be related or inbred, and should be thick-limbed and compact in size. Select young hens, as they are prolific layers and not so prone to wander. Each fancier has his favorite breed; mine is the Bronze, as they are so quiet and take on flesh rapidly and attain a large size. We sold, in January,

TOMS HATCHED IN JUNE DRESSING  
18 LBS.

Be careful in buying turkeys or eggs not to buy from yards where there has been cholera or other contagious diseases. It is much better to buy breeding stock in the fall or early winter, as the stock to select from is larger and prices are lower. The diet, which is of much importance, can also be more carefully attended to as the breeding season approaches. Corn, oats, wheat and buckwheat with an occasional warm mash until Feb. 1 is good feed. After that date but little corn should be fed but plenty of oats, bone meal, wheat and milk, as they are muscle and bone-forming foods. Provide access to pure, clean water at all times as well as to the dust bath, gravel, oyster shells and lime. Lime insures hard-shelled eggs, which is of great importance. An occasional feed of chopped clover or cabbage leaves is much relished until grass comes. At least once a week give a tablespoon of Sheridan's condition powder in their warm feed to six turkeys. Also give a teaspoonful of the Douglas mixture in a gallon of drinking water twice a week. My turkeys have access to a shed and to roosts out of doors, but unless the night is very cold or stormy they do not go in the shed. When new turkeys are taken from the crates look them over thoroughly for lice, especially in the large hollows between the quill feathers on top of the wings. Dust them plentifully with insect powder.

### TO INSURE FERTILE EGGS.

mating must occur 10 days before laying. A peculiar call well known to the turkey raiser announces that the hen is hunting a nest and now comes the tug of war, for 9 out of 10 will persist in laying just where they should not, either in the woods, a mile

away, or along a stream or swamp. When the turkeys have mated, fix a number of nests by carrying an armful of leaves to clumps of bushes, selecting the site with a view to setting the hen. Never where they will be in danger of foxes, muskrats or other animals, and when the hen starts to seek a nest to deposit her first egg, keep watch of her and make her lay at least near where you wish her to. If she has stolen a march on you and got a nestful of eggs, shut her up at night and do not liberate her until the next afternoon. When she wants to lay she will probably go straight to her nest. When following her follow without being seen, for a hen turkey takes the lead for being sly and watchful. If she outwits you, in four weeks from the time you saw her last, if you have young turks, take one in your hand and go near to where you saw her last and the chirp of the turk you have will bring an answering call from the hen.

### CONFINEMENT FOR TURKEYS IS A FAILURE.

You can keep turkeys in any field that has a fence they cannot crawl through, by taking a piece of shingle two inches wide and over each wing hollow out grooves. Take a piece of strong cotton cloth an inch wide and pass around the wing through the large feathers in the joint next the body and around the grooves and tie securely but not too tight, thus fastening the piece of shingle across the back and wings. We never use this except when the hen is turned out with her young turks. Turkey eggs should be kept in a dry, cool place, and turned every day. As soon as the first hen wants to sit, set her and a common hen at the same time, the turkey on 18 or 20 eggs and the hen on from 9 to 11. Then if they hatch over 18, as they should do, place their coops near together and they will run together all the season. If they hatch less give them all to the turkey. Turkey eggs hatch best on the ground or low down on a nest prepared by putting in plenty of moist earth. Do not make the nest deep and hollowing or set the largest hens until they lay the second time, as they are more apt to break the eggs.

Dampen the eggs under common hens frequently with tepid water. You will get little chance at those under the turkey, as they are very close sitters and the less they are interfered with the better. If you wish to move the turkey from where she has laid, take a large slat coop or dish crate, turn it upside down, make a nest at one end and move the hen at evening and by morning she will be reconciled to her new quarters. After the first week let her off every two or three days, or they can be left on the four weeks by keeping fresh food and water and the dust bath accessible.

### IN THE WILD STATE

the tom kills all the young turks he can find, hence the desire of the hen for seclusion. It is best for the same persons to attend the turkeys during the breeding season, doing everything up as quietly as possible. In about 28 days the little turks will begin to hatch. Do not disturb them the first day. The first feed should be hardboiled egg crumbled fine or stale bread or crackers, slightly moistened with water, and squeezed dry as possible. After the first two weeks, add rolled oats, oatmeal and cracked wheat all dry, and clabbered milk scalded and drained in a colander.

Add chopped onion or better green tops to the bread or clabbered milk twice a week. Twice a week give a tablespoon of the condition powders to two quarts of feed. Never feed but little of anything at a time and mix up fresh each time, as turkeys when young are small, delicate eaters. We never feed corn-meal unless baked and treated like the stale bread. When the turks get their first feed they are removed to a large coop or pen of rails away from other poultry and not close to the house or barns. The toe used for a mark should be clipped and treated with the carbolic grease, the top of the head is also greased, and under and top of the wings is dusted with insect powder.

The hen also should be again treated thoroughly for lice, the turkey's greatest enemy. If the turkeys are dying, look for lice. You can scarcely see the large gray ones that burrow deep in the top of the head and you may look a six-weeks-old turkey all over and not find a louse, when if you will examine the deep creases on top of the wing you will find it swarming with big, gray pests. The little turks need clean water, bone meal, gravel and the dust bath. If you have no chopper, buy weekly some stale beef, cut it up and see how greedily the little turks devour it. Give a few drops of Douglass mixture twice a week in the drinking water or in sweet milk. If the turks show signs of diarrhea, give a few drops of spiced syrup of rhubarb and powdered chalk with their soft food or in milk. The coop is moved in two weeks, always to dry, clean quarters and away from animal pests. If the weather is pleasant, when the turks are a month old turn the hen out. Three times a day is often enough to feed them now. Always be sure they are in their coop at night and do not let them out until the dew is off, or if it is stormy. The turkey hen will only go a short distance when turks are young, and will stop wherever a storm overtakes her and hover her young, while a common hen tries to see how much ground she can cover in a day and runs for shelter when it rains. We have never lost a turkey from gapes or roup and never a small one from cholera.

After the turks are half-grown, if they have good forage, feed twice a day, always being sure they are at home at night and counted. If the gobbler shows a bad disposition and kills young turks or chickens, dispose of him as soon as practicable. We have had hens lay a second time when turks were a month old and the tom assumed the care of her first flock. Feed your turks for growth until Nov. 2, when those to be fattened should be separated from breeding stock and feed plenty of corn and corn meal. The last week it is well to coop them up."

## The Dairy.

### SEPTEMBER CHEESE.

This month should be the best of the whole season for fine cheese, as milk is rich, and the cool nights and warm days are just what is wanted for cheese-making.

As soon as you have enough milk in to cover the bottom of the vat, apply the heat, so as to advance your milk, heat the first milk to over 90° F. and let the last milk cool it down to the proper degree for setting. Be sure and use your rennet test every day, and ripen your milk so as to have about 3

hours from the time you put in the rennet until you run off the whey.

Set at 86° to 88°, with enough rennet to have it fit to cut in 45 to 50 minutes; cut before it becomes too firm, i. e., when it will break before the finger, cut 3 or 4 times according to the knives you have; if the blades are close together, 3 times, if your knives are coarse, 4 or even more; cut as evenly as possible; stir slowly at first, with the hands removing the curd from the sides and bottom of the vat, apply heat very slowly at first, stirring with the agitator, cook to 100° F. If you have any difficulty in getting a good firm curd, cook to 102° F. After the cooking is completed, stir your curd well with the small hand- (hay) rake, and as soon as the first acid shows on the hot iron, remove the whey down to the top of the curd, and then stir constantly until your curd is firm. Give slightly more acid in the whey than in August.

As soon as you have the required amount, draw off the rest of the whey, pa king your curd on each side of the vat. As the weather may be cool, you should have a blanket to put over your curd and keep it warm, always over 94° F.; cut into blocks and turn in 30 minutes, then every 20 minutes, after the first time, piling double the 2nd time, increasing each time you turn, until you get it 4 or 5 blocks deep. If your curd is not gassy, as soon as it has that glossy and Indian rubbery appearance, put it through the curd mill; but if gassy, pile higher and keep warm until that gas has disappeared; stir for, say 20 minutes before salting; salt at the rate of 3 lbs of salt to 1000 lbs of milk, stir for 15 or 20 minutes, and put to press at 80° to 85° F. Make as high cheeses as you can, and have boxes to hold them. Press evenly and slowly at first; in 45 minutes take out and pull up the bandage, using hot water to rinse your cloths in. Press them well before leaving them for the night, and see that they are pressing even in the morning; if not, take them out and turn them, cutting off the edges if any, leave the cheese in the press at least 20 hours, turn them every day in the curring room and keep that room as near 65° to 70° as possible. Look out for the cold nights; a little fire sometimes is needed; do not let them get chilled or you will have pasty, bitter cheese. Give good weights and stercil the weights in plain figures at the end of the laps on the boxes.

PETER MACFARLANE.

St. Hyacinthe July 26, 1894.

### "WHAT AILS MY BUTTER?"

Every week in the year we receive more or fewer inquiries from private dairymen and their wives concerning some difficulty they are having with their butter. We have noticed that in the majority of cases the trouble complained of was a too quick loss of flavor. Customers would complain that the butter became frowzy long before it ought to. The trouble principally lies in the imperfect methods for getting the buttermilk and casein out of the butter. The frowzy or cheesy taste in butter is caused wholly, we believe, by the presence of casein. There is only one effective way to remove it, and that is to stop the churning when the granules are small and wash it out with cold water. For the first washing it is well to use a fairly strong brine. Being heavier than water the brine forces a more complete separation of the particles of butter from the buttermilk and there is also less waste of

butter when the buttermilk is drawn off below the butter. Where butter is required to be kept for some time, it is imperatively necessary that it be freed from all particles of curd. There is a widespread carelessness on this point, especially in the making of farm butter. At the Great Barrington meeting of the Massachusetts Agricultural Society last winter, the amount of casein in the butter exhibited ranged from 49, to 8.24 per cent. The report says of the latter that "it was terribly rancid." Nearly all of the creamery butter makers understand the necessity of cleansing the butter from all caseous matter. Of course first-class conditions must attend the milk and cream in all stages if fine butter is made, but we know from actual experience that thousands of farmer's wives spoil their butter by not using effective methods to remove the buttermilk. It is impossible to remove it as thoroughly by working as by washing. Some people are afraid to wash buttermilk out for fear of injuring the aroma and flavor of the butter, but their course quite often ends in making butter which goes off flavor, or becomes rancid, in a short time. This idea of stopping the churn while the butter is in small granules and washing out the buttermilk has been the order with good buttermakers for years, yet a large proportion of the farm butter brought to the stores and sold at low price is made in the old way and the buttermilk worked out. It seems easier for a "leopard to change his spots" than for some people to change their methods of butter making.

#### Tuberculosis in the Wisconsin Station Herd.—Full Details Promised in an Early Bulletin.

ED HOARD'S DAIRYMAN.—I take this opportunity of making a brief announcement concerning the tuberculosis in our herd of dairy cows at the University farm. Last winter one cow, shortly after calving, began to run down very rapidly and was placed by herself in a box stall. About this time it was decided best to test the herd with the Koch tuberculin test to see if there was consumption in the herd. The work was very carefully performed by Dr. Russell, our bacteriologist, and Dr. Clark, our lecturer on veterinary science. To our surprise twenty-five animals out of the herd of thirty responded to the test. Twenty-eight animals have been killed up to date, twenty-six showing tubercular consumption of the lungs; a few were very bad cases indeed, though nearly all were very recent. Heretofore our herd had been fully up to average in health, and this trouble was surely of recent origin. Dr. Russell is now preparing a bulletin giving the results of the investigation. This will be issued shortly. Knowing that verbal reports have gone abroad concerning disease in our herd I believe this statement is called for by the situation. W. A. HENRY, Wis. Agr'l Expt Station, Madison.

#### DAIRY CONFERENCE IN SWITZERLAND.

(Continued.)

At the Milk Sterilising Factory of the Milk Society of the Bernese Alps a description of the system of sterilising milk was given by the Society's Chemist, and the plant used was inspected and explained. The process

was not seen in operation, however, and it was somewhat difficult to understand it in all its details without seeing it. Perhaps the manager preferred to allow the visitors' ideas to remain somewhat vague upon essential points. Still, the information given was fuller than might have been expected. The temperature of the milk has to be raised to boiling point, or a little above it, several times, to sterilise it completely, and the bottles must be sealed in a vacuum. It is not clear how germs are kept out of the milk when the bottles have been filled after the heating, and have to be placed in the cylinder, which is filled with steam, while they are being stoppered in order to make a vacuum. Nor is it quite clear how the stoppers are fixed in the steam cylinder. When being stoppered the bottles of milk are, of course, at a boiling temperature, and their contents shrink slightly, so that there is a space in the neck of each bottle, which becomes filled with steam. As cooling takes place the steam in the bottle condenses, leaving a vacuum. Butter and sterilised cream are also made in the factory. Indeed, butter is the chief product at present, most of it being sent to Paris.

The luncheon and its most interesting accompaniments, briefly described elsewhere, took place after the visit to the factory. Afterwards there was a drive through a beautiful country and several very picturesque and prosperous-looking villages to the Dairy School and Farm School at Rutti. At the former Dr. Wutrich has eighteen pupils at a time, who remain with him for a year, and are instructed in the manufacture of butter and Emmenthaler, Limburger, and skim-milk cheese also in milk testing. The arrangements and appliances are excellent. At the Farm School, where forty boys are received for a two-years' course under Director Klönning and his assistants, there are about 125 acres of land, and a large herd of Simmenthal cows is kept, with a good number of pigs. Sixty cows were seen in their stalls—a splendid lot. The uniformity of excellence among the cows seen has been very striking. No doubt more animals of inferior character would be seen on the mountains and on small farms, but it is clear that the two national breeds of Switzerland have been developed to a rare degree of perfection. In this Simmenthal district it is claimed that the milk of the breed is superior to that of the Schuytz in quality, though not equal in quantity, and that the former is much the more valuable for fattening after milking has become no longer profitable.

#### BERNE, THURSDAY EVENING.

To-day the only excursion was to the Dairy School at Fribourg, a well-equipped and extensive Government institution, established eight years ago. Only fourteen pupils are received at one time. They are instructed in practical and scientific dairying, including the making of Gruyère, half-fat, skim milk, Camembert, and Brie cheeses, and butter. The appliances are excellent. There is a capital museum, as well as a well-equipped laboratory. In the latter the students are instructed in the testing of milk, and bacteriological experiments are carried on.

In the afternoon a visit was made to the Federal Chemical Experiment and Control Station of the University of Berne, in the theatre of which a conference was held, under the presidency of Colonel von Wattenwyl. Papers were read by, or for, Professor Rossel on the Station, Dr. Schaffer on

"The Control of Milk in the Canton of Berne"; and Colonel von Wattenwyl and M. von Schiferli on "The Swiss Association for the Breeding of Cattle." Professor Long also presented a short paper on "The Position of Dairy Farming in Great Britain," which was not read but was prepared for giving information to Swiss people interested in the subject.

Professor Rossel stated that the first research and control station for testing agricultural produce in Switzerland was established at Rutti twenty years ago by the Bernese Government. Later on the agricultural experiments were handed over to the Berne Laboratory, under Dr. Rossel. The expenses are borne partly by the Canton of Berne and partly from the payments of those who have goods analyzed. In 1893 1,005 samples were examined, including samples of cattle food, manure, and other agricultural commodities. If the goods are found not in conformity with the samples, or not worth the price, the purchaser may refuse to accept them, if not corresponding with the guarantee, the seller must pay compensation. Dr. Rossel also delivered an address in French upon the advantage of chemical research.

Dr. de Freudenreich explained the importance of bacteriology in connection with dairy work. He spoke English with such facility that the rapidity of his utterance rendered it difficult to hear what he said. He was asked some questions, and gave some interesting replies. He said that the germs of human disease found in milk were killed at a much lower temperature than is required to kill the germs commonly found in milk. Some of the latter require a temperature of 115 deg. Centigrade, while the germs of fever or diphtheria are destroyed at 70 or 80 deg.

Dr. Schaffer pointed out that, by a Bernese Act passed in 1888, all articles of food offered for sale are placed under a fixed market and chemical control. The police undertake the inspection, and have inspected articles submitted to examination, and he explained the proceedings adopted. He exhibited a new acidometer for testing the acidity of milk.

Colonel von Wattenwyl said that the agricultural associations of Switzerland were the offsprings of the agricultural unions, which probably means that the special societies, such as cattle breeding associations, arose out of general unions; similar to trade unions. Associations of farmers and small landowners have been formed to sell farm produce to advantage and to buy goods required on favourable terms; but hitherto the chief action taken has been that of purchasing goods and distributing them at much lower prices than individual small farmers would pay if they purchased separately. When travelling in England about twenty years ago, Colonel von Wattenwyl was struck with the arrangements for improving the breeding of cattle, and through his initiative the system of pure breeding was introduced for the two great breeds of Switzerland, at first on a small scale, but extending gradually at the first beginning, and rapidly lately. Since 1890 about 200 breeding associations have been formed. In 1893 a central office was established at Berne, directed by the President and Secretary of the Cattle Breeders' Association, in order to facilitate the exportation of pure bred cattle. If desired, a competent judge of cattle is engaged to act as an agent, and is pledged not to accept a fee from buyer or seller.

Professor Long gave some of the

agricultural statistics of the United Kingdom, described our breeds of cattle and principal varieties of cheese, and gave a short account of the making of butter and cheese, for the information of Swiss persons interested in the subjects.

This closed the working part of the Conference. In the evening Colonel von Wattenwyl and other distinguished Swiss gentlemen were entertained at dinner by the Association at the Bernerhof Hotel. The rest of the time, up to Monday evening, will be devoted to pleasure excursions in the Bernese Oberland and the Lucerne district.

#### FEEDING FAT INTO MILK.

By Feeding Pure Fat to the Cows.—How and Where it was Done.

ED. HOARD'S DAIRYMAN:—Here is a nut for the chemists to crack, and one that will "give them pause." "You can't do it," they say, "can't feed fat into milk only through albuminoids, no carbohydrates on the cow's plate, please, if you want milk and that with fat in it."

That is about the burden of the song, as I have heard it at the institutes in this state, sung by all the speakers during the last five years; but, all at once, there comes a man who says, "Ah! there! don't be too previous; wait till you hear from Schoharie County, N. Y., and then see how plain a tale shall put you down."

Now listen! Down in Schoharie county, this state, two and a half miles from Cobleskill, live a couple of brothers; they answer to the name of Van Dresser, and are well known all up and down the Schoharie and Hudson River valleys; that is, they are known to the horse, sheep, and cattle breeders of those sections of the state also. They are Hollanders by descent and have a little of the brogue on hand yet. Their great-grandfather, Henry, came from Holland, and located at Schenectady, where he preached to the heathen. Their grandfather John, and their father John were farmers. When the father started out for himself, he was not worth a fig, but when he was called away, he owned a farm of 710 acres in Schoharie county. Brains, thrift, economy, and a soil that yielded bountiful crops did it. When the two brothers, of whom this history makes mention, started out for themselves, they did not have money enough to post a letter. To-day they own a fine farm of 200 acres, all of which is devoted to stock breeding, except 15 acres in orchard, and 6 acres in hops. French Coach, and Cleveland Bay horses; Holstein-Friesian cattle; Cheviot sheep; and Angora rabbits comprise their repertoire, and they always perform everything down on the bills. The Cobleskill Horse Breeders' Association, of which the brothers are members, keeps at this farm two stallions, one a French Coach, and the other a Cleveland Bay, that are not surpassed, it is said, by any stallions of these breeds in the state. Last fall, after the Chicago fair closed, they sold their imported Cheviot ram, "Sough," No 162, that weighed 301 lbs., for one dollar per lb. They have a large flock of the same blood, and are known to all the sheep breeders in the state as breeders of this celebrated breed of sheep, of which there are but very few in this country.

But I started to tell you about feeding butter fats into milk, and will do it. The two Van Dresser brothers live in the same house and everything is held in common, nothing being divided. Henry looks after the cattle and sheep, and J. W. after the horses. Henry was on the Institute director's staff of speakers last winter, his theme being "The Dairy Cow; How Shall We Know Her?" and it was after I had heard him make the statement in an institute, that I obtained from him the interview which follows. He attends all the fairs in Eastern and Central New-York, where he acts as judge of cattle, and is known as expert, without a rival in the state.

"Mr. Van Dresser," I said, "you said at the institute to-day, that not only have you fed butter fat into milk, but did it by feeding pure fat. I want you to tell me all about it for the benefit of the readers of HOARD'S DAIRY-MAN. Will you do it?"

"Yes sir, certainly I will, and with the greatest of pleasure."

"Remember," I said, "your statement is going to kick up a big dust, as it is contrary to all the chemists' laws; so be careful and do not exaggerate nor 'bite off any more than you can chew.' Give me just the facts of the case as tersely and compactly as possible. Now what is your experience in feeding fat into your cows milk?"

"I experimented with four cows; we wanted to force them as high as possible in butter production, because we wanted them registered high in that line of production."

"What was the breed?"

"The thoroughbred, registered Holstein-Friesian."

"What had been the rations fed before you began feeding fat?"

"Forty pounds of ensilage with hay at noon. Their grain ration was composed of a mixture of 200 pounds of wheat bran, 100 pounds of cotton seed meal, and 100 pounds of corn meal. The daily ration was six pounds of the mixture at morning and the same at night. Their skim milk was also fed back to them."

"Was the grain ration put into the milk?"

"No; it was fed separately."

"What was the weight of the cows when you began the test, and how much butter was each making at the time?"

"Cow number one weighed 1,189 pounds, and made 14 pounds of butter on the above ration in seven days. Cow number two weighed 1,130 pounds and made 12 pounds of butter in seven days. Cow number three weighed 1,168 pounds and made 8½ pounds of butter in seven days. Cow number four weighed 1,000 pounds and made 13 pounds and 1 oz of butter in seven days. On an average, it required a fraction above 23 lbs. of milk for one pound of butter. Now I have given their record before making my experiment. Not being satisfied with the results, I resolved to try the experiment of feeding pure beef tallow. I fed at first one fourth of a pound, shaved and mixed with their grain ration, twice a day. Within about two weeks from the time I began feeding the tallow, I increased the amount to two pounds of tallow per day. The following is the result: Cow number one made 20 pounds of butter in seven days; cow number two made 17½ pounds of butter in seven days; cow number three made 16 pounds 14 ounces of butter in seven days, and cow number four made 17 pounds and 1 ounce of butter in seven days.

The foregoing was the result, as I tested at the fifth week's feeding of the tallow, their grain and other rations remaining the same as before. During the coming June I intend to try the experiment more fully, but with two cows instead of four, and in the same ratio, only I shall conduct it for a longer period and allow the cows to run in the pasture at the time. As tallow is but three cents a pound, while butter fat is worth at our house not less than 25 cents per pound, while the quality of butter was superior to that before made, I think I can use our tallow to a better advantage than to put it into "oleomargarine."

How many pounds of milk were required for one pound of butter when your tallow test closed? I asked.

"Just 18½ pounds; thus it is seen there was a decrease in the quantity of milk required, of about 3 pounds for one of butter, and an increase of butter fat of nearly a like amount. The milk was set in small pans and the cream churned with a dash churn."

"At what time of year was the test made?"

"In April and May; the cows being kept all the time in the stable."

"How were they watered?"

"In the stable, twice a day."

"How long had they been fresh in milk when you began the tallow test?"

"From February 1st to March 1st preceding."

"How many cows did you have in the herd at a time?"

"At that time we had 32, all of them registered Holstein-Friesians."

"In what year was this test made?"

"In 1892. It has never before been given out for publication, although I have given the substance of it several times at Institutes and dairy meetings."

"Did you test your skim milk and butter-milk with a Babcock machine?"

"No sir; but I shall test both skim milk and buttermilk next time; also the whole milk of each cow every day during the test."

"How much moisture did you leave in the butter?"

"I do not know. It was churned, worked and salted just as it had been before, and was nice, marketable butter, and brought the usual prices. It nearly all went to private customers, who saw no difference in quality; at least they never mentioned it, and we, ourselves, could not discern any."

## The Farm.

### SOME USEFUL EXPERIMENTS.

The records of important experiments in the new number of the Royal Agricultural Society's Journal invest it with an exceptional interest. First in the order of precedence is a short paper by Mr. James Mason, of Eynsham Hall, Oxfordshire, giving the results of a field trial carried out to show the fixation of free nitrogen by leguminous plants. The experiment is not yet complete; but, as far as it has gone, the results are striking. Two plots of poor clay soil, which were so deficient in nitrogen that they produced respectively only 10½ cwt. and 9 cwt. per acre of barley and oats, grain and straw together, were manured in the autumn of 1888 with a heavy dressing of basic slag, supplying abundance of phosphoric acid, lime, and magnesia, but no nitrogen, and spring beans were planted in 1889. The result was an average crop of 46 bushels of beans, with 23 cwt. of straw per acre. It is clear that the beans did

not obtain their nitrogen from the soil. In 1890 a mixture of cowgrass, with clover, alsiko, trefoil, and lucerne was sown on the two plots, and a crop of 1 ton 8 cwt. of hay per acre was obtained in the same year, while, in the next year, two cuttings weighed nearly 3 tons per acre, no manure having been applied. The next procedure was one intended to test the accumulation of nitrogen in the soil. Mr. Mason would have sown a cereal if it had not been that wireworms, mice and small birds had been troublesome. He decided to grow potatoes, without manure, and he obtained about 8 tons per acre. (1) He has now sown wheat, without manure, and expects a moderate crop, as the potatoes have taken out of the soil only a small proportion of the accumulated nitrogen. About 450 acres of arable land are being gradually brought by Mr. Mason under systematic rotation, beginning with a two year's leguminous crop, followed by two nitrogen-consuming crops. Up to the present time results correspond with expectations.

Feeding experiments on sheep and cattle at Woburn come next. In the case of sheep the trial was intended to test the value of malt as a food. In 1882-3 an experiment showed that the difference between the feeding properties of barley and of malt and the malt dust produced from the same quantity of barley was trifling, and in 1891-2 the experiment was repeated in modified form. Seventy-five Hampshire tegs were divided into three pens of twenty-five each, the first being, during the first part of the period, fed on ½ lb. of linseed cake each daily, the second on ½ lb. of linseed cake and ½ lb. of barley and the third on ½ lb. of linseed cake, 1-6 lb. of barley, and 1-12 lb. of malt, while all had swedes and clover-hay chaff *ad libitum*. The barley and malt were griddled. (2) The idea was to give equal money values in barley and malt, the latter having cost per ton just double the value of the former. Linseed cake was dear when the experiment was begun, the first lot having cost £10 9s. per ton delivered at the nearest station, and the second lot £9 13s. The cost of the barley was £7 per ton, and that of the malt £14. The time extended over ninety-three days, divided into periods of thirty-six, twenty-nine, and twenty-eight days. At the end of the first period the quantity of extra food was raised from ½ lb. per sheep daily to ¾ lb., and at the end of the second period to 1 lb. The daily gain per sheep during the entire period was 53 lb. for the first pen, 45 lb. for the second, and 47 lb. for the third. With reference to the cost of the food, and the money returns of the sheep when sold, the following conclusions are drawn by Dr. Voelcker, who records the experiments:—"The extra return in Pen 1 (linseed cake) over Pen 2 (linseed cake and barley) of £2 19s. 4d. was obtained at the extra expenditure in additional food of £1 0s. 10d., and the feeding with linseed cake alone was more remunerative than the feeding with a mixture of linseed cake and barley in equal quantities. The extra return in Pen 3 (linseed cake, barley, and malt) over Pen 2 (linseed cake and barley) of 9s. 4d. was obtained at the extra expenditure in additional food of 16s. 11d., and thus the addition of malt to the mixture of linseed cake and barley did not prove advantageous." Thus linseed cake alone paid best, independently of its superior manurial value, while the addition of malt did not prove remunerative. We must say, however, that

malt was treated badly in this trial. A farmer who desires to use malted grain has no need to pay double the cost of barley for it. He can malt it himself, and give it without drying, and without loss of culms. A much more serviceable experiment would be one in which roughly malted barley, not dried, should be tried against an equal quantity of griddled barley. (1)

The experiment with cattle was intended to ascertain the difference between feeding them entirely upon crops produced on the farm and feeding them on imported food, such as linseed cake. Accordingly twelve Hereford bullocks were divided into two equal lots, both getting swedes and clover-hay chaff *ad libitum*, while Lot 1 had beans, oats, and barley in equal proportions, and Lot 2 linseed cake. The beans were ground into meal, the oats were crushed, and the barley was griddled. The average daily gain in live weight per head in 107 days was 2.01 lbs. in the case of Lot 1, and 2.03 lbs. in that of Lot 2; while the cost per head for extra food was £3 6s. 9d. in the former case and £3 17s. 10d. in the latter. The linseed-cake lot gave a money return, when sold, of 4s. 10d. each over that of the corn-fed lot, obtained at an extra cost of 11s. 1d. Thus there was an advantage of 6s. 3d. per bullock in favour of the home-grown food, leaving the value of the manure out of account, as it is left out in the article. Dr. Voelcker points out that the price of the cake was high, the average cost of two lots being £9 16s. a ton, delivered, and he adds that, at 16s. less per ton of cake, the results of the two rations would have been practically equal. But, then, it is also to be borne in mind that, at the end of 1891, corn was higher in price than it had been for some years, and much higher than it is now. The beans cost £2 per qr. of 50½ lbs.; the oats, £1 5s. per qr. of 336 lbs.; and the barley, £1 5s. 6d. per qr. of 448 lbs. The cost per ton was £9 16s. for linseed cake, £9 9s. for beans, £9 3s. for oats, and £7 for barley. When prices are in proportion, it may be assumed that there is a direct advantage in using home-grown food. Nor should the indirect gains be forgotten. In the first place, cartage of corn to the station or town, and of cake back, is saved; and, much more important, the consumption of corn on the farm tends to raise its price in the market.

Mr. Charles Whitehead, as Chairman of Seeds and Plant Diseases Committee, presents a report drawn up by Dr. Voelcker on the experiments carried out by the Society for the Board of Agriculture, in different parts of England, for the prevention and cure of potato disease in 1892. We can give only the conclusions, as follows:—" (1) That the dressing with *bouillie bordelaise*, though it does not entirely prevent disease, has a marked effect in lessening the extent to which disease spreads. (2) That, associated with the lessening of disease is an almost certain increase of crop, which more than pays for the cost of application of the dressing. (3) That the best treatment is an early application of the *bouillie bordelaise* before disease has made its appearance, and that this should be repeated if the marks of the first dressing have been removed by rain. (4) That, even if delayed until disease comes, lessening of the spread of disease may to some degree be effected by a late dressing, and the cost, as a rule,

(1) Mix 10 lbs of malt with 100 lbs of corn- or barley-meal and 50 gallons of water at 180° F., let the mash stand in a warm place, for 2 or 3 hours, closely covered, and give it to your cows.

(1) 260 bushels of our weight.—Ed.  
(2) Cracked; not ground into meal.—Ed.

will be sufficiently increased to pay for the application." At the Chesham station, it is to be noticed, the early use of the dressing diminished the yield of sound tubers in three varieties out of four. The conclusions as to the superiority of early dressing (before disease appears) are derived from three stations only, as there was no late dressing at the two other stations, and at one of these the use of the mixture caused a loss in two varieties out of three. In the more elaborate experiments carried out for the Society at Woburn by Dr. VOELCKER there was an increase of sound tubers in sixteen instances, and a decrease in fourteen. The use of molasses with the sulphate of copper and lime (*houllie bordelaise sucree*) was not more effective than the mixture without molasses. Where the crop was increased by the dressing, it was in every instance but one increased most from the early application (before disease appeared.) On the other hand, where the crop was diminished by the dressing, the diminution in four cases out of six was greatest from the early, or preventive, treatment. Then, the net losses of the dressings amount to a great deal more than the net profits. More remarkable still, the greatest increases on the dressed plots, with one exception, were in the early crop, where no disease appeared at all, even where no dressing was applied. On the whole, then, the results appear to us hardly as favourable as Dr. VOELCKER'S conclusions represent them to be.—*Eng. Agr. Gazette.*

POTATO DISEASE AND ITS REMEDY.

A CAREFUL examination of the evidence contained in the Report of the Board of Agriculture on "Further Experiments in Checking Potato Disease" is not calculated to support in an unqualified manner the conclusions laid down emphatically by the compiler and other experts whom he quotes. We are told that, although the Bordeaux mixture does not entirely prevent or cure the disease, it usually diminishes the extent of the malady materially, increases the weight of sound tubers, and proves remunerative; also that the preventive treatment (application of the mixture before disease appears) is much more effective than the curative treatment (application after disease has appeared). Consequently, growers of potatoes are advised to adopt the preventive treatment, which means, if it means anything, that every piece of potatoes should be dressed, whether there is reason to expect disease in it or not. Indeed, M. GRARD is represented as saying that "it is always advisable to apply the dressing, as it is never safe to assume that the disease will not make its appearance." Now, let us apply this advice to the circumstances of the year 1892, to which the experiment described relate, and see what it involves. The area returned under potatoes on farms in the United Kingdom was 1,276,535 acres, and probably if the areas in gardens were added the number of acres would be doubled; so we may put the total at 2,550,000 acres, in round figures. The average cost of a dressing is about 9s an acre, and a single dressing on the estimated area would have been £1,147,500. Experts usually recommend two dressings, which would make the expense £2,285,000. We should say that the smaller sum is much in excess of the total loss from potato dis-

ease in 1892; while we have no doubt that the doubled sum would exceed the average damage done by disease, one year with another. Surely the advantage of applying the dressing should be beyond all question to justify advise involving such expenditure by way of insurance against disease. Let us examine some of the results of the trials of 1892, then, in order to see to what extent they may be pleaded in support of this advice.

We take first the experiments carried out of Woburn for the Royal Agricultural Society as probably the most carefully conducted and the most accurately chronicled, and we notice the gains and losses in sound tubers, which we find entered to the credit or discredit of the Bordeaux mixture. There were fifteen trials, in each of which one plot was dressed twice before disease appeared, one was dressed once after it appeared, and one was not dressed at all. Judged by weight of sound tubers, we find that the preventive and the curative treatment alike did good in eight cases, and harm in seven. As it is desirable to show to how considerable an extent a crop can be benefited or injured by the dressings, we give the quantities of increase and decrease for each method of treatment of sound tubers in each of the fifteen trials, as compared with the corresponding produce of the untreated plot, and the net gain from each method.—

PREVENTIVE TREATMENT.						CURATIVE TREATMENT.					
Gain.			Loss.			Gain.			Loss.		
T.	cwt.	qr.	lb.	T.	cwt.	qr.	lb.	T.	cwt.	qr.	lb.
0	7	2	24	1	13	0	14	0	10	2	24
1	3	0	0	1	8	1	30	1	1	1	4
1	12	3	12	0	15	2	24	0	15	2	24
1	16	0	16	0	5	0	0	0	1	1	12
2	1	2	8	1	2	3	12	0	6	1	4
0	2	3	12	1	11	3	12	0	19	3	12
0	14	2	8	2	0	1	4	1	9	2	24
2	17	0	16					0	8	12	16
10 15 3 12 8 18 1 2						6 16 0 8 5 6 1 10					
Net gains, 1 ton 17 cwt. 2 qr. 10 lb.						1 ton, 9 cwt. 2 qr. 26 lb.					

The cost of the two dressings under the preventive treatment was at least 18s. per acre, so that less than two tons of net gain in sound tubers cost £13 10s. The cost of the single dressing under the curative treatment was £6 15s. to set against the net gain of less than one and a half tons of sound tubers. From a pecuniary point of view, then, the use of the Bordeaux mixture at Woburn was a failure under either method of treatment. It is to be observed, too, that the greatly superior efficacy claimed for the preventive treatment is not borne out by the results, the net gain under it being not quite 8 cwt. more than under the curative method, while it cost twice as much. It is not fair to apply two dressings under one method and only one dressing under the other, and then to compare results, but, as the figures stand, the preventive method is shown to be more costly than the curative one. It may be said that there was so little disease in 1892 that neither treatment had a fair chance of showing what good it could do in arresting the malady. That is quite true; but then the results show all the more clearly the danger of dressing potatoes with the Bordeaux mixture when there is no need of it. In other words, the figures show that the advantage to be expected from the application of the dressing are so doubtful that it would be folly to incur the expense of using it on all crops of potatoes, on the mere chance of disease attacking them.

Experiments carried out in other places by the Royal Agricultural Society for the Board of Agriculture were more favourable to the dressing than those conducted at Woburn on its own behalf, but not by any means uniformly favourable. In Kent the preventive treatment succeeded in each of the three trials, in Bedfordshire in each of the two trials; in Lincolnshire in each of the three trials, and in Devon in each of the two trials. But in Cheshire it failed in three cases out of four, and in Pembroke in two out of three. The results of the trials made by the Wilts County Council are represented as all but one favourable, in some cases showing a gain of five tons an acre of sound tubers, the average gain being 2 tons 11 cwt. per acre. But when we see that the total crops are represented as having ranged up to the rate of 19 tons 17 cwt. per acre, (1) we cannot help feeling a little dubious as to the correctness of the calculations. The experiments of the Kent County Council are recorded in a puzzling manner. In most cases the yield of sound tubers was increased by the dressing, but not in all, and the best results were gained on plots dressed only once, one set having been dressed three times. The trials made in Ireland by the Land Commission appear to have been extraordinarily successful, an increase of yield in nearly all cases being re-

corded as the result of the dressings. At the Albert Model Farm, Glasnevin, four different dressings were used with three varieties of potatoes. The most successful dressing was 5 lb. of sulphate of copper and 5 lb. of quicklime to 25 gallons of water, with or without 5 lb. of treacle. Of the six trials with these mixtures three resulted in an increase and three in a decrease of yield of sound tubers. Where the mixture consisted of 11 lb. of copper-sulphate and 5½ lb. of lime to 25 gallons of water, the yield was diminished in two out of three cases; and where it was made up of 5½ lb. of the sulphate and 2½ lb. of lime to 27½ gallons of water, the yield was diminished in all three cases. Altogether the failures numbered eight, against four successes. In another experiment with a variety of potato very liable to disease, all the dressings were successful. These were all preventive dressings. At the Munster Agricultural School dressings identical with those used at Glasnevin were applied just when a few spots of disease had appeared. The yield of sound tubers was increased in eight cases and diminished in three. On the whole, the results of trials in England and Ireland give a balance of advantage in favour of the use of the Bordeaux mixture; but, taking into consideration the expense, and bearing in mind the risk of diminishing the yield, especially when little or

no disease appears, we cannot endorse the recommendation of the universal application of the remedy. It will be observed that the most favourable results were obtained in the trials of the Irish Land Commission, and it is stated that in all the districts in which those trials were carried out disease prevailed extensively. There were three dressings, which must have cost at least 23s. an acre, and in some cases disease had appeared in the crop, or close to it, when the first dressing was given. The conclusion fairly to be derived from all the results which we have considered seems to be that the dressing should be used when there is reason to expect disease, either from the land or the variety of the potato being specially liable to the malady, or when the season is so wet that a general attack is probable. Under such circumstances, it is probably advisable to dress the crops before disease appears. But when the chances are against disease appearing in a crop, our advice is to "let well alone." *Agr. Gazette.*

ADVANTAGE OF MACHINE PLANTING.

L. J. P. LOWELL, MICH.—I have raised from 20 to 40 acres of potatoes per year for the past 15 years, and have carefully tested both hand and machine work. I think there is a great difference in favor of machine planting, especially on soil recently turned. Our best growers here prefer clover turned in in the spring, and it is almost impossible to furrow out a freshly-turned sod. Much of the land in potato-growing sections is more or less hilly; the machine leave a ridge on the row of potatoes, and they are not liable to wash. In planting by hand the potatoes are more or less zig-zagged in the row unless more than ordinary care be given, while the machine leave them in line, which is an important point in close cultivation. The potatoes can be put at a more uniform depth, and one reason, not among the least, is that where one stops the machine at night the work is finished, while many times just as a field is marked or furrowed, a heavy storm comes, and the whole has to be done over. My experience is that with just as good preparation of soil and the same amount of good cultivation, as large crops can be raised with machine as hand planting, and much cheaper.—*R. N. Y.*

SOILING CROPS.

On the grounds of the Mass. exp. sta. are a large number of crops which produce a large yield of forage, extremely nutritious, and at a minimum cost for manure. On June 20 the editor saw a magnificent plot of oats and vetches just ready to cut. The oats grow 3 ft. in height on which the vetches were twining. The vetch belongs to that class of plants that take their nitrogen from the supply in the air in the soil by means of the nodules on the roots. The vetch is also a very nutritious crop and contains as much, if not more, protein than almost any soiling crop. The yield at the station of vetch and oats is 5½ tons per acre or 3½ tons per acre more than the grass lands of the station average. In April 3½ bu of oats and 2 bu of vetch seed are sown p. a. (1)

(1) About 130 bushels.—Ed.

(1) 2 of oats 1 of vetches and 1½ of pease, would be better.—Ed.

By July 1 this is all cut and Hungarian grass planted. This may be cut in September and the pieces sowed to winter rye. Thus three crops are raised some seasons, two at others.

R. W. J.

**MANGEL LEAVES.**

Another product of the farm which is of somewhat questionable value is mangel leaves. The fodder is too good to waste, and is yet critical feed for valuable sheep, as it often causes scour and sometimes abortion in ewes. It is, however, a benefit to the land to take the sheep over it, if not too wet, and if the leaves are allowed to pine or wither a little they may be fed without danger. A back run on to stubbles or grass during the day still further obviates any disadvantage, and, if fed judiciously in this way a fortnight, or even a month's folding may be got out of the mangel leaves to the economising of the main winter supply of roots. The danger of feeding mangel leaves is not serious, and is further decreased if a little rape or a few swedes are interspersed among the crop of mangels, and a few of the smaller mangels are left on the ground. A solid crop of mangel is of course desirable, and looks well, but a few turnips, swedes, or rape, left with the leaves upon the land make a variety for sheep, and help to prevent mischief. The custom, which we have heard, even in the columns of the AGRICULTURAL GAZETTE, of breaking ewes' teeth, and after this mutilation to turn them on to mangel fields in order to eat the leaves only, is distinctly cruel, and we hope is not now practised by any farmer. It is in all respects reprehensible, and the mere fact that leaves thus consumed are full of juice of a somewhat purging character is alone sufficient reason for abjuring a miserable and cruel system. The acid principle to which the purging nature of mangel leaves is due is oxalic acid in combination with lime, forming the poisonous compound oxalate of lime. This sometimes exists in the form of distinct needle-shaped crystals, and has been known to cause death. Those who feed mangel leaves ought to be aware of the kind of risk they run in so doing, but in practice the leaves may be fed if they are not given in excessive quantity, and only as part of a mixed diet.

*Agr. Gazette.*

**CULTURE OF THE POTATO.**

J. J. WILLIS, SUPERINTENDENT OF LAWES AND GILBERT'S EXPERIMENT STATION, ROTHAMSTED ENGLAND.

Taking thirteen countries where the potato is largely grown, their aggregate area under the crop being about twenty-one million acres, and their aggregate produce about sixty-one tons, there is not one that reaches the average produce per acre of Great Britain. Norway, Belgium and Holland the most nearly approach the yield of Great Britain, and it is of interest to observe that these and Denmark, are the countries that most nearly approach the United Kingdom in yield per acre of wheat and barley also. It is, then, only the countries of small total area, and of small area under the crop, that at all nearly equal Great Britain in yield per acre of potatoes; and among them Belgium

and Holland more nearly approach the United Kingdom in density of population, and in the quantity of live stock kept per acre, and consequently in the supply of animal manure. The aggregate area under potatoes in the United Kingdom is rather over one and one-third million acres, and the aggregate produce is rather more than six and one half million tons of tubers. Against this, we find that the United States of America has an aggregate area under the potato crop of nearly two and one-fourth million acres, giving an aggregate produce of about four and one-fourth million tons of tubers, equal to an average yield per acre of 187 tons only, being the lowest average quantity per acre obtained in either of the thirteen countries where potatoes are extensively grown.

The following table shows us the chemical composition of potatoes tubers and of potato vines, also the quantities of the various constituents abstracted from the soil by the growth of one thousand pounds of tubers and of one thousand pounds potato-vine, both in the green and in the ripe condition.

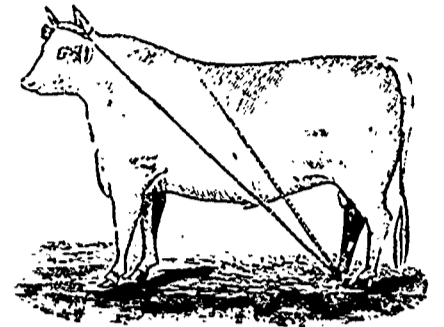
	In 1000 pounds of		
	Tubers.	Vines, green.	Vines, ripe.
	Lbs.	Lbs.	Lbs.
Water .....	750.0	825.0	770.0
Organic matter .....	241.0	159.4	218.2
Ash .....	9.0	15.6	11.8
The Ash consists of—Potash .....	5.2	2.3	0.9
Soda .....	0.1	0.4	0.1
Magnesia .....	0.4	2.6	2.7
Lime .....	0.2	5.9	5.5
Phosphoric acid .....	1.8	1.0	0.6
Sulphuric acid .....	0.6	0.9	0.6
Silica .....	0.2	1.2	0.5
Chlorine .....	0.3	0.7	0.4
Sulphur .....	0.2	0.6	0.5

The data thus given show us in a conspicuous manner that in the culture of the potato special study should be devoted to the needs of the tubers, as distinguished from the requirements of the vines. It is a common experience that while a full crop of potato tubers cannot be secured without luxurious growth of vine, yet there is often luxuriance of vine with a poor yield of tubers. This happens when the fertiliser used or the soil itself contains an excess of lime, as when superphosphate or gypsum has been applied without other ingredients; and the contrary is found to be the case where potash fertiliser or wood ashes have been used. In the culture of this crop experience shows that a liberal use of the complete artificial manures which contain all the constituents of the plant, including vines and tubers, answers best. That is to say, although the crop requires a full available supply of potash, magnesia, lime and phosphoric acid within the soil, yet that these constituents being provided the amount of produce is largely dependent on the available supply of nitrogen at the command of the plant. In practice, barnyard manure, or seaweed, where it can be obtained, is mainly relied upon. These are used in very large quantities per acre, and are sometimes supplemented by liberal dressing of artificial manures, both mineral and nitrogenous. It is probable that, independently of the liberal supply in barnyard manure of all necessary constituents of the potato crop, its beneficial effects are in a considerable degree due to its influ-

ence on the mechanical condition of the soil, rendering it more porous and easily permeable to the surface roots, upon the development of which the success of the crop so much depends.

Then again something may be due to an increased temperature of the surface soil engendered by the decomposition of so large an amount of organic matter within it, while the carbonic acid evolved in the decomposition will, with the aid of moisture, serve to render the mineral resources of the soil more soluble. The potato is, in itself largely a kitchen and market garden crop, as well as a farm crop; and for the production of garden vegetables generally very large quantities of barnyard or stable manure are applied, beyond what is required as a mere supply of constituents to the crops—the process being to a great extent one of forcing; and a necessary result is a great accumulation of unexhausted manurial residue within the soil. In fact, the potato crop removes a less proportion of the nitrogen of barnyard manure than any other farm crop. It has also been found that the most characteristic

drawn after a sketch sent us by A. Moseloy, Jackson county, Wisconsin, shows a very effective and simple device for the purpose. A sound, half-inch rope is secured at one end to the base of the horns. A slipping noose must not be used, but a knot tied at the extremity is drawn into a loop at the proper place. The next operation is to get the off hind foot into a large loop of the rope, which is then drawn taut between the hoof and the



Device for Throwing an Animal.

dewclaws. The operator now stands close to the near hip with the loose end of the rope firmly grasped in his right hand. Seizing with the left hand the other part of the rope he gently but firmly pulls the head toward him, at the same time taking up the slack by holding all taut with his right hand. Soon the distance between horns and heel will be so shortened that the animal will come down on its haunches and then on its off side. All is held taut while it is necessary to hold the animal down to pick out any nails or snags from its feet, pare the hoofs and anoint for hoof-ail or any other purpose.—*Hoard.*

**RESULT OF SUBSOIL PLOWING.**

The following letter, giving the results of experiments with subsoil plowing, was recently received by the Secretary of Agriculture from Mr. Peter Youngers Jr., of Youngers & Co., Geneva, Nebr., and is deemed of sufficient interest to warrant its communication to the Agricultural press.

Mr. Younger writes as follows:

Having practiced subsoil plowing extensively on our nursery grounds near Geneva in growing fruit and ornamental trees with gratifying results, we concluded to experiment with grain and vegetables.

The ground was prepared by subsoil plowing in the fall of 1892, and the crop of 1893 consisted of corn and potatoes. Corn that year being only a very moderate crop in this vicinity (maximum forty bushels per acre, and the average not exceeding twenty bushels), we harvested a crop of seventy-five bushels per acre from a strip of ground that had been subsoiled. The potato crop was practically a failure in this vicinity; the result of our experiment was a good crop—about 125 bushels per acre.

This season (1894) the crop consists of rye, oats, corn, and potatoes. Rye harvested indicates a yield of thirty-five bushels per acre, while rye in an adjoining field—the same seed, planting and harvest, but not subsoiled—will yield ten bushels per acre.

Oats on land subsoil plowed in fall of 1893 will yield forty to forty-five bushels per acre; oats on land subsoil plowed in fall of 1892 will yield thirty to thirty five bushels per acre; oats on land adjoining, under ordinary cultivation, will yield ten to fifteen bushels per acre (the average crop under the adverse conditions that prevailed), in each instance the seed, soil and planting being the same.

result of the increased growth of potatoes under the influence of nitrogenous manures is an increased production of starch, which means flouriness, mealiness, or a superior quality of tubers. Poor and inferior soil cannot yield first-class potatoes, they must of necessity be of a waxy nature after cooking, because they lack the constituents necessary for the formation of starch.

It has been found in the Rothamsted potato experiments that potato disease, though largely dependent on season, developed much more in tubers grown by highly nitrogenous manures, and containing a juice rich in nitrogen, than under contrary conditions. Finally, it has been shown that a result of the disease is a destruction of starch, the formation of sugar, the loss of organic substance, and the growth of the fungus at the expense of the tuber.

That cattle do not consume food in proportion to their weight has long been a familiar fact to practical men; and, now, Mr Valancey Fuller comes forward with a statement that some of his lightest cows eat and digest more food than the heavier ones.—*Ex.*

**HOW TO THROW AN ANIMAL.**

It sometimes becomes necessary to throw a bull, steer or cow for surgical or other purposes. It must be done with the least possible danger of injury to the animal. Our illustration,

The superiority of subsoil cultivation is especially conspicuous in the length of straw and stand on the ground.

The results of experiments with this year's corn and potatoes cannot at this time be determined. With a continuation of the present favorable conditions we shall have the largest yield of corn we have ever had. Even under these favorable conditions the corn on subsoil plowed ground seems to possess a special element of strength that will, in all probability, exert its influence in demonstrating the value of subsoil cultivation. (1)

### THE PHILOSOPHY OF HOEING.

It may be overdone or underdone. There is reason in everything, "even in roasting eggs," as the saying is. So in hoeing crops. If we hoe up the soil in large lumps, as we are apt to do with the very serviceable modern prong hoes, we let the keen, dry air into contact with the starting but enfeebled roots, and, by their parching an irreparable injury is done. Such lumps should be crushed down so as to be permeable to air throughout, and yet serve to protect the root from its free sweep. But, as in avoiding Scylla we may run to wreck on Charybdis, so in crushing the soil, we may make it too fine, in which case the first heavy rain will run the surface together in a crust impervious to the air, and, for want of enough of air, essential to active root action, growth will be checked until the hoe or its equivalent is used.

### HOCHELAGA FARMERS.

AWARDED PRIZES FOR THE BEST MANAGED FARMS.

As Well as for green Crops—Prizes Suggested for Large Market Gardens Keen Competition.

Messrs. Robert Ness, of Howick, and J. B. Auclair, of St. Vincent de Paul, who were appointed to decide in the annual competition for the best farms and green crops under the auspices of the County Hochelaga Agricultural Society, have completed their labors and handed in their report to the secretary-treasurer, Mr. Hugh Brodie. They report that they find that the farmers in the county are taking a much livelier interest in agricultural improvement than hitherto and that agriculture generally shows great progress in the county. They have had a pleasant inspection, though at times they have found competition keen and close. In regard to the crops of potatoes, carrots and onions, so many competitors were about equal that the successful competitors have but very little to boast of. In the judging of farms the successful competitors had evidently studied the programme authorized by the Council of Agriculture of the Province of Quebec and profited by the success of other farmers in the county who had met with such success, and consequently, judging from the experience of those others, they evidently have made it a matter of study in order to attain to the same footing as such previous successful competitors,

(1) Taken from Dr. Hoskins' paper *The Vermont Farmers' Advocate*, v. p.—.

and of course have also achieved success. With reference to the premises of D. Jeremie Decarie, an ex-president of the Society, and his brother, Telesphore Decarie, of Notre Dame de Grace, their farms are both used as market gardens; consequently, as the lots are allotted for proficiency, (1) it does not meet the view of market gardeners, the judges, of course, had no other alternative but to follow the rules laid down by the Council of Agriculture; but they suggest that prizes should be offered for farms composed or utilized for market gardening of such magnitude as those of the Messrs. Decarie. Their farms, so far as farming is concerned, are as well kept and worked as other farms which are worked on a different system.

Following are the awards of the judges:

#### BEST MANAGED FARMS.

Parish of Sault au Recollet—First prize, William V. Henderson, 62 points \$12; second Joseph Turcot, 41½ points, \$3.

Parish of St. Leonard de Port Maurice—First prize, George Buchanan, Cote St. Michel, 85 points, \$12; second David Scott, Cote St. Michel, 71½ points, \$8; third, Magloire Delorme, Cote St. Michel, 63 points, \$6; fourth, Hubert Vannier, Cote St. Michel, 61½ points, \$4.

Parish of Longue Pointe—First, Hormidas Lapointe, Longue Pointe, 66 points, \$12; second William H. Trenholme, Longue Pointe, 63 points, \$8; third, George Hogg, Longue Pointe, 56 points, \$6.

Parish of Pointe-aux-Trembles—First George Irving, Pointe-aux-Trembles, 63 points, \$12; second, Jacques Leonard, Pointe-aux-Trembles, 52½ points, \$8; third, Madame Cormier, Pointe-aux-Trembles, 51½ points, \$6.

Parish of Riviere des Prairies—First, Francois Armand, Riviere des Prairies, 60 points, \$12; second, Pierre Malo, Riviere des Prairies, 44½ points, \$8.

Parish of Notre Dame de Grace—First, Thomas A. Trenholme, Coteau St. Pierre, 73 points, \$12; second Robert Benny, Coteau St. Pierre, 64½ points, \$8; third, D. Jeremie Decarie, Notre Dame de Grace, 60½ points, \$6; fourth, Hugh McDonald, Cote St. Luc, 50½ points, \$4.

Parish of Montreal, inclusive of places called Petite Cote, Cote St. Louis, and Ou'remont—First John Nesbitt, Petite Cote, 80 points, \$12; second, Duncan McLachlan, Petite Cote, 74½ points, \$8; third, Samuel J. Nesbitt, Petite Cote, 70½ points, \$6; fourth, Daniel Drummond, jr., Petite Cote, 68½ points, \$4.

#### STANDING GREEN CROPS.

For the best half arpent of potatoes treated with Bordeaux mixture in order to prevent potatoes from rotting and, consequently, to increase crop—First, Duncan McLachlan, Petite Cote, \$5.

Best half arpent of the new variety of oats called "Prize Cluster"—First, Duncan McLachlan, Petite Cote, \$5.

Best field of one arpent of tares or lentils—First, John Nesbitt, Petite Cote, 3 points, \$1; second, George Buchanan, Cote St. Michel, 2½ points, \$3; third prize, Duncan McLachlan, Petite Cote, 2 points, \$2.

Best arpent of Indian corn for fodder—First, Thomas A. Trenholme, Coteau St. Pierre, 5 points, \$4; second, Duncan McLachlan, Petite Cote, 4 points, \$3; third, George Buchanan,

(1) Rather dark.—Ed.

Cote St. Michel 3½ points, \$2; fourth, George Irving, Pointe-aux-Trembles, 3 points, \$1.

Best one-half arpent of Mangol wurtzel—First, William Trenholme, Longue Pointe, 6 points, \$5; second, Thomas Irving, Logan's Farm, 5 points, \$4; third, Hugh McDonald, Cote St. Luc, 4½ points, \$3; fourth, George Hogg, Longue Pointe, 4½ points, \$2; fifth, John Nesbitt, Petite Cote, 4 points, \$1.

Best half arpent of Swedes—First, John Nesbitt, Petite Cote, 4 points, \$5; second Thomas Irving, Logan's Farm, 3 points, \$4; third, Duncan McLachlan, Petite Cote, 2 points, \$3; fourth, Robert Bonny, Coteau St. Pierre 1 point, \$2.

Best half arpent of carrots—First, George Buchanan, Cote St. Michel, 5 points, \$5; second, John Nesbitt, Petite Cote, 4 points, \$4; third, Thomas Irving, Logan's Farm, 3 points, \$3; fourth, Robert Benny, Coteau St. Pierre, 2½ points, \$2; fifth, Samuel J. Nesbitt, Petite Cote, 2 points, \$1.

Best field of four arpents of potatoes—First, Samuel J. Nesbitt, Petite Cote, 6 points, \$3; second, Jeremie Gagnon, Cote St. Michel, 5 points, \$4; third, David Scott, Cote St. Michel, 4 points, \$3; fourth, John A. Scott, St. Michel, 3½ points, \$2; fifth, Magloire Delorme, Cote St. Michel, 3 points, \$1.

Best field of four arpents of wheat—First, Damase Martineau, Cote St. Michel, 3 points, \$5; second, Thomas Irving, Logan's Farm, 2½ points, \$4; third, Robert Benny, Coteau St. Pierre, 2 points, \$3.

Best field of four arpents of barley—First, Pierre Malo, Riviere des Prairies, 3 points, \$5; second, Madame Benjamin Ceruner, Pointe-aux-Trembles, 2½ points, \$4; third, George Irving, Pointe-aux-Trembles, 2 points, \$3; fourth Hugh McDonald, Cote St. Luc, 1½ points, \$2.

Best field of 4 arpents of peas—First, Léandre Lauzon, Cote St. Michel, 5 points, \$5; second, Hubert Vannier, Cote St. Michel, 4 points, \$4; third Magloire Delorme, Cote St. Michel 3½ points, \$3; fourth, Madame Benjamin Cormier, Cote St. Michel, 3 points, \$2.

Best field of 4 arpents of oats—First, Daniel Drummond, jr., Petite Cote, 6 points, \$5; second, Magloire Delorme, Cote St. Michel, 5 points, \$4; third, John A. Scott, Cote St. Michel, 4½ points, \$3; fourth, Hubert Vannier, Cote St. Michel, 4 points, \$2.

Best field of one arpent of horse beans—First, Thomas Irving, Logan's farm, 4 points, \$5; second, Jean Marie Berice, Cote des Neiges, 3 points, \$4; third, Robert Benny, Coteau St. Pierre, 2½ points, \$3; fourth, John McIntosh, Cote St. Michel, 2 points, \$2.

Best field of half an arpent of onions—First, Jeremie Gagnon, Cote St. Michel, 7 points, \$5; second, John A. Scott, Cote St. Michel, 6 points, \$4; third, George Buchanan, Cote St. Michel, 5 points, \$3; fourth prize, Jean Dagenais, Cote St. Michel, 4 points, \$2.

Best market garden not less than four arpents—First, Thomas Wiseman, Outremont, 7 points, \$8; second, Oneimo Dagenais, Cote St. Michel, 6 points, \$6; Third, Thomas Hall, Outremont, 5 points, \$4, fourth, Gedson Dagenais, Cote St. Michel, 3 points, \$2.

Best kitchen garden—First Thomas Irving, Logan's Farm, 4 points, \$5; second, George Buchanan, Cote St. Michel, 3 points, \$3; third, Samuel J. Nesbitt, Petite Cote, 2 points, \$2.

### CROPS.

**Wheat.**—Not much sown but looking very well; wheat being at 50c in Chicago, it will pay farmers to raise some other grain.

**Oats.**—Despite the rust, insect, and other causes will be a fair crop, some sections a good share has been harvested.

**Barley.**—Good crop, nearly all saved; some will be blackened with the wet weather; still it will not hurt it much for cattle feed.

**Rye.**—A considerable quantity grown in Joliette, Berthier and down to Three-Rivers, only a fair crop.

**Buckwheat.**—Seems to be doing well; grown quite extensively in the French parishes.

**Corn.**—This crop has done well since June commenced. A good deal of it only for fodder and the silo; have also seen some horse, beans and sunflowers for the Robertson mixture, as it is generally called.

**Potatoes.**—Doing excellently, although I have heard some complaints about rot, it seems too bad that the farmers would not give the preventive as recommended by Prof. Saunders a trial to see if it would really stop the rot.

**Roots.**—Doing splendidly. Sugar-beets in the neighborhood of Berthier grown quite extensively. After the beets and mangels, the next in order of breadth sown comes the turnips, carrots are not quite so extensively sown as the two former, I see many patches left far too thick: for a strong healthy vigorous growth, roots, like almost every thing else, want air and sunlight.

**Apples.**—A good fair crop but many of the famous are spotted, other varieties do not seem so badly affected.

**Small fruits.**—Gooseberries and currants have done fairly well this season, grapes are rather better than usual.

**Hay.**—On the whole the crop is much better than most people anticipated in the earlier part of the season, some (too many in fact) fields to cut yet in the neighborhood of Quebec City. The heads are beginning to get brown and the stalks woody, people want to let it grow as long as possible, and then grumble nowadays about the bad weather: why not commence a few days sooner? (Because it is not the custom!—Ed.)

**Grass.**—Has done well, and the second crop of clover, where the first crop was cut in good time, abundant, some few farmers have sown patches of oats, peas and vetches for green-meat. The receipts at the factories have fallen off considerably on account of the horn-fly, heat, and want of good feed. The remedy for the horn fly is a simple one, but like the Parable in Scripture: "wash and be clean," so simple that few use it. The exports of cheese are away in excess of last year; over 60,000 more to date; and still the prices have been very good. While there has been more butter made too, the shipments have been quite a few thousand packages less. Query: what is going to be done with the surplus?

This report covers the south western part of the Province and on the north shore down to Quebec.

PETER MACFARLANE.

St-Hyacinthe, May 6th 1894.

### MINNESOTA EX. STATION.

In conclusion, the important points, briefly stated, in regard to ensilaged peas and wheat bran as a cattle food, are:

1. Peas furnish a food rich in nitrogenous compounds, of which the dry matter contains about twelve per cent,

which is about twice the amount in ordinary ensilaged crops

2. In every hundred pounds of the dry matter, seventy-six pounds were digestible, and all of the constituents except the ash and fibre, were nearly equally and evenly digestible.

3. The pea ensilage and bran alone took the place of corn ensilage, hay and a mixed grain ration, saving the more expensive barley and oil meal, and giving the same milk and butter yield.

4. The cow that gave the better returns in milk and butter from the same weight of food digested one per cent more of solid matter and retained three per cent less nitrogen than the one that gave a fifth of a pound less butter per day.

5. Nearly ninety five per cent of the nitrogen of the food was returned in some form; about one half was returned in the urine, one-fifth in the dung, and from one-fifth to one-fourth in the milk.

6. About eighty-two per cent of the original fertilizer materials in the food was returned in the dung and urine.

7. Finally, pea ensilage is a valuable cattle food, rich in nitrogen, largely digestible, and returns a valuable manure to the soil.

The storing of peas in the silo as described in this article may be unfamiliar to many and appear to be out of the reach of the ordinary farmer, but this is not so. A silo like the one in which these peas were stored can be made by any farmer at no great expenses and any one who is desirous of securing one more valuable cattle food, should give peas, either field-cured or ensilaged, a trial.

#### CANADA IMPORTING BUTTER. (1)

Ottawa, Jan. 22.—A consignment of butter has been received at Montreal from Liverpool. The price of that article has advanced in Canada to such a point as to warrant importations from England. Mr. Foster will have to put a tariff on butter. It would seem as if our trade with England, besides falling off to the extent of millions of dollars, has taken on the peculiar twist of having Canada import dairy products from England. The hay trade with Great Britain has again proved a failure this season. Dealers in hay claim at \$7.50 there is no profit in shipping hay to England, and as the lowest price of hay in the Canadian market is at present quoted at \$8 to \$9.25, the condition of the trade is easily seen.—*Witness.*

#### PLANT MORE HEAVILY OF PEAS.

Peas are most nutritious, either eaten green, boiled into soup or ground into meal. They are excellent for fattening animals and the straw, if not too much dried out, makes good fodder. Lastly, they belong to the leguminous order of plants and are therefore, to a certain extent, self-fertilising, and plowed under form excellent green manure. (2)

There are numerous varieties of the pea, and the farmer should choose those varieties that would best suit his natural conditions. The land for peas should be well prepared. A friable, limy, light gravelly soil is the best. A soft, rich soil is unsuited to

(1) Mr. Macfarlane, who ought to know, does not agree with this! See p. 172.

(2) We fancy this "green manuring" is early dead.—Ed.

them, and strong clays and stiff loams are also unsuitable. A soil to grow peas must contain lime, as without this ingredient fairly abundant rotative crops cannot be grown. The land should be broken up in the autumn, cross-plowed, harrowed, smoothed, or rolled in the spring, and brought in every respect to a fine seedbed. When the land is ready it may be conveniently laid off in rows by running a horse marker over the ground. This implement will make a little furrow in the soil about 1 in. or more in depth. (1)

The rows should be from 3 to 3½ ft. apart, and the seed should be sown by running an ordinary garden seed drill over the depression made in the soil by the marker, and the peas should be sown about ½ in. apart in the row. At this rate about 3 bush of peas will be required per acre. The ordinary class of drill will plant and cover the seed. The earliest varieties, planted when the land is presumably damp and cold, are not planted more than 1 in. deep. When they break through the ground it is beneficial to pass along the row with a fine garden rake and draw the soil carefully over the top of the peas. If a marker has been used for planting, the driller will not quite fill up this depression or furrow when passing along to plant the peas, and the earth thus drawn in with the rake will quite fill up this depression and perhaps round the soil up over the peas a little. This will destroy any weeds that may be springing up along the row, and will give the peas a further covering of about 1 in. in depth.

*Farm and Home.*

#### DEEP PLOWING, ROOTS AND ROTATIONS.

There is no agricultural writer whom we find more worth reading than Mr. Jenner Fust of the *Montreal Journal of Agriculture*. He is thoroughly informed in the English farm methods of thirty years ago and more; and since then he has given his attention, carefully, to Canadian agriculture. He naturally finds some things to puzzle him in American farming, *south of his Province*; not finding, it easy to appreciate the powerful action of the sun upon soil and crop. Indeed, without our dozen years of experience in Kentucky we should have illy appreciated it ourselves; for New-England, different as she is in climate from old England, still hardly more than Canada can realize to its full extent the effects of that dry, clear atmosphere, so favorable to the radiation of heat from the earth at night, and to the full force, in heat, light and actinic action, of our American sunshine. The vicinity of the Atlantic tempers these forces materially in lower Canada and New-England. To an Englishman this is scarcely apparent; but the Western man (away from the great lakes) notes it at once. (See p. 171!)

In regard to deep ploughing on clay land it is a fact that commonly, when Americans have attempted it, they have done it unwisely—literally "running it into the ground." Mr. Jenner Fust, commenting upon the subject, says: "My good friend, Dr. Hoskins, has a sensible remark on the danger of 'unpractically trained men' being influenced by 'theoretical talk.' He quotes an instance of the injudicious application of deep plowing on a clay farm in Rhode Island, and adds: 'Since that, most of the theorists have stopped talking of deep plowing.' Might I,

(1) 3 to 4 inches is the best depth.—Ed.

certainly not an unpractically trained man, be allowed to say that the failure of deep plowing, many instances of which have come under my observation, may generally be traced to two sources: either the crop sown immediately after the deep furrow has been a grain-crop, or the deep plowing has been given in spring. In the south-east of England, where I farmed for fifteen years, the best men observed, in connection with this subject, three rules: never to bring too much of the raw sub-soil up at once; never to plow deep for any crop except a manured root-crop; and the deep furrow was invariably given before Christmas."

Upon all our lighter soils in America we must insist that experience is against deep plowing—that is, to exceed six or eight inches. The English market gardeners, even, who come to this country full of the idea of trenching the ground two feet deep, soon (if they have sense) drop in to the American way of plowing not more than ten inches. If they lack sense, they soon lack money also; and go home disgusted with the soil and climate of America, and with the "ignorance" of Americans generally.

Our deep frosts are another cause which makes deep plowing unnecessary. The fall rains fill the ground with water which the winter's cold freezes, often to the depth of six, and on bare spots sometimes twelve feet. The surface is thus elevated two or three inches by the expansion of the soil water in freezing, and to the unscientific workman it is a constant wonder in setting posts in spring, that though the post may almost fill the hole, all the dirt that came out may be rammed in around it. No plow can leave the land in better condition than the frost leaves it; and there was some depth of philosophy (albeit perhaps unconscious) in the remark of the city man, who stood watching a farmer plowing, that he "did not understand how it was that God had made all the land wrong side up." This peculiar softness and permeability of American soil is well illustrated by the fact that in garden land, plowed or dug not more than eight inches, the tap roots of parsnips, beets and carrots often go straight down two feet and more. Our lighter soils are too loose in the spring, and that culture which is directed to compacting them is the best.

Though the frost acts to heave up the clay, even more strongly than the loams, yet it does not fine them so completely; and for tilled crops, and even for grass, thorough tillage of such soils is very important. But our clay lands pay better in grass than in any other crop; and they are unfit, in the north for every crop that needs warmth. They are well suited to the small cereals, and as in order to maintain their productiveness in grass it is necessary to adopt some short rotation, these crops furnish the most suitable means. To drain clays is good husbandry, and they require the most careful and intelligent tillage, but very deep plowing is not only needless, but hurtful to them.

Mr. Jenner Fust is much interested in Mr. Aitkin's success as a beet-grower, and thinks, as we do, that his example and instruction is most valuable to American farmers. No doubt, if we could succeed in getting an immigration of two or three thousand just such young Scotch farmers as our friend Aitkin, root-growing would have quite a "boom" in Vermont. But, after all, roots would always meet a close competitor in ensilage, and it could be hardly more than an even thing whether the Yankees, in the long run, would be converted to beets or the

Scotchman to corn. One point in Mr. Aitkin's paper Mr. Jenner Fust wants a little light upon. He says: "I do not quite understand the figures. For instance, the manure leaves are said to be worth \$2.07 a ton, and the roots \$1.48 a ton,—fifty-nine cents less! This must be a mistake, as, practically, the leaves are very poor food, and theoretically, according to Wolff, the roots are worth \$2.80 a ton, and the leaves \$2.00. In England the leaves are rarely harvested; the sheep—generally the ewe flock—are run over the field after the roots are carried off, and they tread in more than they eat."

DR. HOSKINS.

#### THE FAILURE OF CLOVER.

(By the Editor.)

Many years ago, Boussingault, the celebrated French agricultural chemist, suggested that the failure of the clover-plant arises from the exportation of the products of the farm. "If," said he, "the fodder is consumed on the spot, the greater part of the constituents of the plant will be restored to the land in the manure after having passed through the cattle; and as an average crop of clover takes up 77 lbs. of potash and soda per acre, the food of clover will be always at its service. It will be quite otherwise if the fodder is sold off the farm; and it is to the repeated exportations of the produce of the artificial grasses that the failure of clover, as observed in soils that have long yielded it abundantly, is undoubtedly due." If selling off the products of the farm is the cause of the failure of clover, why does it not have the same effect on wheat?

But Boussingault, though a most enthusiastic farmer, was not acquainted with the methods of English farmers. In the Eastern counties of England, as we have often stated, the clover-plant fails if repeated oftener than every third rotation; and, there, not only is there nothing exported but grain and meat, but if a tenant-farmer—and they are in 19 cases out of 20 tenants—were to sell a load of hay or straw off the farm it would be a breach of his agreement, and his landlord could enter on the premises at once. Of course, we are speaking of the great arable farms, where hardly even one cow is kept for the supply of the house. In such seasons as the past few years have presented, greater liberty has been allowed the tenants as to the sale of hay and straw.

On these farms tons and tons of artificial manures and foreign food are expended; it is within our own knowledge that the Brothers Webb, of Braham, &c., used to buy between them a whole brig's cargo of Egyptian beans, from 300 to 400 tons, and how many tons of oilcake we dare not say; and the well known Hudson, of Castle Acre, Norfolk, we know bought 800 tons of cake at one purchase: and, yet, on the farms of such men as these the clover failed just as it did elsewhere. We lived and farmed among them, and we know what we saw yearly. Well; Boussingault recommended wood-ashes and soda as a cure for the clover-failure: what does Sir John Lawes say about it?

"In the year 1848, having some acres of clover in one of our fields, we decided to apply a variety of manures to the crop and to re-seed it if it died away. I have no intention of giving a history of all our failures, but will merely mention the fact that after 22 years, feeling somewhat weary of wasting money on several acres of



land without being able to arrive at any definite result, I left Dr. Gilbert to go on with the experiment on a more confined area. I may say, however, that the last ten years have given no more successful results than the 22 years that preceded them" \*\*\*.

"Passing from this experiment to another, let us see what were the effects of sowing clover where large quantities of artificial manures of different kinds have been used.

Upon the remainder of the land—which had been under clover experiment for twenty-two years—I have now for some years been trying to grow other plants of the same order; and in addition to the red clover, I have five other clovers, and nine other agricultural crops of the leguminous order.

I may mention here that, as far as chemical composition is concerned, the Leguminosæ bear a very close relation to each other, and the same is the case with the graminaceous crops; while there is a marked difference between beans and wheat, or peas and barley the distinction between the various plants of the same order whether we take the whole plant or the seed alone—is very slight, wheat and barley, corn and rice closely resemble each other. My object therefore in carrying out this experiment was to ascertain whether the land was only clover sick, or whether it would refuse to grow any other crop of the same order.

With this view I sowed three red clovers, three white clovers, two yellow trefoils, the scarlet trifolium, the purple lucerne, the red sainfoin, the pink clover the vigorous Bokhara clover and the purple vetch, every one of these had the option of feeding upon thirty-four different combinations of manures, each of which differed more or less from the other. This experiment has now been going on for several years, but I propose to give merely the result of a competitive examination made at the end of May of the present year.

Before going into the field I decided on classing the various crops under three heads.

1. Good, which should represent a fair agricultural crop.
2. Very good, where the produce was much in excess of an ordinary crop.
3. Bad, where the produce was much below that of an ordinary crop.

Each crop had, so to speak, thirty-four chances, having the opportunity of producing a good result under any one of the thirty-four manures.

The whole of this portion of the field has been under experiment since 1848, its condition therefore with regard to manures is well known. Since 1854 no dung has been applied and upon certain portions of the land, no substance containing nitrogen has been used since the commencement of the experiment 1848.

The result of the examination brought out the following facts. Five of the different crops grown, sainfoin, tares, Bokhara clover, lucerne and trifolium, under every one of the thirty-four different manures came under the class described as good, or very good. Four of the other crops have the large majority good or very good, four have the majority bad, but the only crop which is bad throughout the whole of the thirty-four varieties of manuring is the ordinary red clover.

It so happens that this red clover adjoins the sainfoin which is a good or a very good crop under every variety of manuring. In no case is the sainfoin less than 18 inches high, while in several cases it is between two and three feet high and very thick upon

the ground; the red clover, on the other hand, is not more than two or three inches above the ground, and although the plant is not diseased there is no active growth.

Passing from this field, let us now go into another where an experiment on an ordinary four course rotation of turnips, barley, clover and wheat, was commenced in 1848, and has been carried on, without any application of manure to the soil, from that day to the present time.

The third crop in the rotation was clover and a very large produce was carried off, but, as usual, when the attempt was made to repeat the crop after an interval of four years it failed. Beans were then tried in place of the clover, and they were repeated every fourth year until 1873, when red clover was sown with the barley. The crop was not diseased in any way and it stood the winter, but there was no active growth, and the hay, which was cut three times, only weighed 11 ton per acre. A crop of beans was taken in the fourth following year, and red clover was again tried with the barley in 1881; the crop as on the previous occasion, stood the winter well, and there is an excellent plant at the time I am writing, but the produce is very small and would hardly pay for the expense of cutting.

In another experiment in the same field where the turnips in the rotation have received a very liberal application of artificial manures every fourth year from the commencement, the clover is an exceedingly large crop.

When this land was first put under experiment in 1848, it was in what we should describe as rather high agricultural condition; the failure of the clover crop when repeated in the seventh year from the commencement, could not therefore be due, to want of food in the soil, as in the interval between 1854 and 1874 the removal of twenty unmanured crops must have greatly impoverished the land, yet we still obtained a crop, though a very small one; and even eight years later than this date we got a crop without diseases. We have therefore before us the singular fact that the disease is not due to poverty of the soil, and that it is not due to richness of the soil is proved by our having succeeded in growing continuous clover crops upon a rich garden soil.

Here I may observe that the remarkable circumstance of other leguminous plants growing luxuriantly where clover would not grow, must not lead us to conclude too hastily that we can continue to grow them; after a few years they may in their turn fail just as the red clover has failed.

I have not referred to the numerous analyses which have been made of both soils and crops in connection with this subject, nor even to the elaborate operations carried on by Dr Gilbert on his small beds, in which he placed the various manure ingredients in layers, several feet below the surface.

My object is to point out to those of my American readers who are interested in the subject, and to the lady—who I am sorry to find has so low an opinion of the farmers and scientific men of England—that there, at least, some attempts have been made to investigate the causes of clover sickness, and it is not from any sparing of time or money bestowed upon the subject if the results have not as yet proved altogether successful.

Rothamsted."

The conclusion Sir John Lawes arrives at is worthy of attention: the disease is not owing to want of available food in the soil, but there is the fact, that red clover grown more than

once in eight years has failed to stand for a crop in the best cultivated farms of the best cultivated district in England. We therefore hold ourselves justified in warning our readers not to repeat the sowings of red-clover too frequently, lest what has befallen others may befall them.

## FARM-WORK FOR SEPTEMBER.

(By the Editor)

Harvest over, probably, except a few late sown oats, and some pease on rich land, where the plentiful rains have induced the persistent growth of the haulm and thereby retarded the ripening of the crop. Why not ensile such a crop? Nothing can be better than such silage for in lamb ewes.

Now is the time to complete the cleaning of the stubbles. A good deal of negligence in preparing for the work of next season is observable among any of our friends. Even at Sorel, they postpone the ploughing of their land intended for the hoed-crops until the spring. This is a very great mistake, let us tell them, but they know it is wrong, and they will improve in this as they have done in everything else.

The cows are now about to give the richest milk of the whole year. They should be fed with stuff likely to enable them to withstand the great draught on their system. A few pounds of cotton-cake, with second-cut clover at night, in addition to their pasture, such as it is, will support them in this the most trying season of the year. Cows, like horses, are now beginning to change their coats, and the change takes a good deal out of them.

Calves should not be stinted of food this month. Their thriving through out the winter depends greatly on their treatment throughout September and October. Make up your mind to get them into good condition before they go into their winter quarters, and then you will have little trouble in keeping them in condition during the cold weather. Once upon a time, we were shocked at seeing ten nice heifer-calves, half bred Ayrshires, turned into a yard at Sorel, in November, with ribs as bare as boards. When we saw them again in the spring following they were covered with vermin, and had made no progress at all. These ten heifers were the produce of eleven cows! The owner did not deserve such good luck. Why do vermin always infest badly fed cattle, and why are they most numerous when the beasts begin to thrive? This, at least, is our experience, but we have wearied our brain in vain to find a reason for it.

As there will be, or should be, a great press of work at hand on every farm, the horses ought to be well fed. The nights will be getting too fresh for them to lie out of doors any longer. Do not, however, change their food too suddenly from grass, as their entire ration, to hay, and oats. A few carrots or swedes, or a few stalks of maize, will keep their bowels from constipation but a pound of linseed—flaxseed—crushed with their oats will do them more good in that way than anything. At all events, you cannot get a day's work at plough out of a horse with nothing but fall grass in his belly. Fall grass is good for the production of butter fat, but of small effect in the production of vigour.

Lambs, like calves, should be carefully attended to, so as not to be allowed to fall off in flesh. The male

lambs are seldom kept over Christmas, in this province, and too many of them are allowed to run, uncastrated, with the ewes: hence, so much strong-flavoured mutton comes to our tables in the winter. All male lambs should be cut and tailed before they are a month old. The long tails of most of the lambs that come to Montreal in the fall deduct greatly from their appearance. Nothing shows off the look of the hind quarters of a sheep so much as a nice short dock; besides, the short-tailed lamb is not so likely to suffer from the attacks of the fly as a long tailed lamb, which is rarely free from accumulations of ordure.

Sows, in places where the buildings are warm enough to make it safe to rear young pigs in winter, are about to litter towards the middle of this month. Don't let the farrowing sow have too much litter, as the piglings often get entangled in the straw, and the sow may lie upon them and smother them. If the sow is, as she ought not to be, very fat, take the pigs from her as they appear, and put them into a hamper with straw until she has done pigging. Remove the after-birth as soon as it becomes detached, and then give the sow a mash of milk and bran. Ground oats and skim milk is as good food for nursing sows as anything, with the wash from the house. In the case of high bred stock, that are generally lazy and hard to move, a rail, 6 inches or so from the ground, and 8 or 10 inches from the wall, all round the sty is a good safeguard against the sow crushing the pigs. If the young ones show any signs of scouring, an ounce of sulphur in the sow's food every 5 or 6 days will usually stop it.

When the pigs are about a month old, a space should be allowed them into which the sow cannot enter. Here, should be a couple of troughs, one for water and the other for pease: they will soon learn to eat, and at six weeks old the males should be cut and the sows not intended for breeding be spayed. Not cutting male lambs and not spaying sow-pigs, when it is not intended to breed from them, are two of the things that no English farmer would dream of. We do not believe there is a village in England in which there is not a man part of whose ordinary occupation it is to spay sow-pigs. Such a bother as it is to fat an unspayed sow! Not only does she refuse to feed during her periodic fits of disturbance, but she won't let the others feed.

At 7 and 8 weeks old, the piglings may be weaned; if they have been treated as advised above, they will have almost ceased to suck. Then, if you have a connection with the Montreal trade, feed them on barley or corn-meal and skim-milk or whey, and nothing else, for a month or so, and by the middle of December you will be able to send your customers such pork as they have never tasted before.

Your poultry will have been keeping themselves for the last month or so, and all this month they will find plenty of shed grain in the stubbles; but as soon as the nights get cold they should be kept in, particularly the young turkeys, as they sometimes get a habit of roosting in the trees that it is difficult to break them of.

If you have pigeons, look to their coots before winter; if there are cracks in the walls, stop them securely, and make the place as warm as possible if you want to have curly squabs. Remember that a pigeon that can fly is not worth eating, therefore, kill them before they leave the nest.

## The Horse.

### THE CARE OF YOUNG FOALS.

By DR. GEORGE FLEMING, C. B.,  
F.R.C.V.S.

So much attention is now given to the breeding of horses, and so much capital is embarked in the undertaking, that any information which may tend to ensure beneficial results in that important branch of animal management should be acceptable to those engaged in it. The following remarks on the rearing of young foals are offered for the consideration of persons who, engaged in horse-breeding, may yet not have acquired that practical experience of its risks and requirements which is essential to guard them from unnecessary trouble and loss. For upon the care bestowed on foals during the early months of their existence will almost entirely depend their immunity from disease and their subsequent vigorous growth and perfect development. To those who have ample experience, directed by intelligent observation, the information I venture to give may be altogether superfluous, though I have more than once been consulted by such persons on some of the subjects to which I am about to briefly refer.

It is acknowledged by those who have had much to do with foal rearing that very much of its success depends upon the manner in which the mares are treated during pregnancy and immediately before and after parturition. The food and the exercise they receive, or the work they may have to perform, are important factors in the business, as idleness and obesity are not conducive to the production of vigorous healthy foals, any more than over work, bad or insufficient food, or any other debilitating cause. If mares must be worked during pregnancy—and judicious labour is undoubtedly beneficial—then they must be liberally fed, in order that not only their own system may be maintained in good condition, but that of the fetus may receive a due amount of nutriment. Grass alone will not suffice, and a certain allowance of oats is necessary, with hay in addition. Oats are the best grain for in-foal mares which require this addition to their food, and they should, if possible be crushed, maize is not to be recommended, as it is stated that when this grain constitutes a principal part of the ration the foals always show weakness of joints and muscles. (1) Even when mares are running out at grass, it may be advisable to allow some hay, and even oats under certain conditions of weather or states of health. To have thriving progeny the mares themselves should be strong and lively during pregnancy and after parturition. It is also recognised that the period when mares are to foal, and the management calculated to regulate that event, demand considerable attention. The best months for foaling are doubtless April and May, the last especially, as then the young creatures are almost certain to have genial weather, and nothing in the shape of food is comparable with the green herbage of spring and early summer for milk production in the dams. Early foaling is only too frequently synonymous with debility, unthriftiness, and stunted growth in the foals, unless artificial treatment is adopted, and even hay and oats do not fully compensate for the absence of grass as an article of food.

(1) Has it that effect "on this side" —Ed.

It is only too well known to breeders that when foals miss a good start at the commencement of their life, and sustain a check to their growth, it generally requires much time and nursing to repair the damage; indeed sometimes the effect is so serious that their vigour and full development are permanently arrested. Foaling late in the year is also objectionable, as the young animals have then not sufficient time to gain strength before the advent of winter.

The season of the year and state of the weather will determine the propriety of turning the dam and foal into the paddock or pasture after parturition, but the sooner this can be done the better for both, if only for an hour or two at first while the weather is fine, as the genial rays of the sun have a most exhilarating influence on the foal. Exposure to rain must be rigorously avoided, as the woolly texture of the foal's coat retains the wet for a long time, and is very likely to give rise to catarrh or some bowel affection. Sometimes mares, and most frequently those with their first foal, do not secrete a sufficient quantity of milk to nourish their offspring. Gentle rubbing of the udder with new milk, and allowing the foal to go to the teat as often as it will, stimulates the gland, while soft, succulent food—such as grass, sloppy mash of boiled barley or oats, to which treacle has been added—assists in exciting the secretion. When the mare chances to be ill or dies, or does not give milk, then the foal must be nursed by a foster-mother, or fed artificially with milk obtained from a mare or she-ass, if this cannot be procured, then cow's milk and water, in the proportion of two of the former to one of the latter, sweetened with a little sugar, answers in the majority of cases. In those instances in which this food does not prove suitable, less of it may be given, and a preparation of husked beans, boiled to a pulp and squeezed through a hair sieve when it forms a thick fluid-like cream, has been recommended as an excellent substitute.

A dose of castor oil to the amount of one or two ounces may be required by the foal so fed, as constipation is not unfrequent, and indeed this should always be given when the young creature does not obtain the first milk of its dam, and also when it is being sucked by the mare, if its bowels are torpid. It is always judicious to notice the state of its bowels, as these are always liable to derangement while the foal is being artificially fed or suckled—constipation or diarrhoea being the most common disorders. Constipation sometimes occurs in a day or two after birth, and unless attended to promptly may entail serious consequences in a short time. Regulating the diet of the mare, giving her frequent bran and linseed washes, and other sloppy food, often gets rid of this condition in the foal, if it does not, then a dose of castor oil and an enema, if the constipation is obstinate, will generally afford relief.

Diarrhoea is more often a source of trouble with foals than constipation, and is in many cases fatal in a comparatively short time. Its causes are more or less obscure, but the food of the mare and bad sanitary arrangements are generally blamed. The diet of the mare should be changed, and crushed barley given to the extent of one or two quarters daily with a diminished allowance of grass, and an equivalent of good hay, with fresh, clean water, while cleanliness in the surroundings should be observed, or the mare and foal removed to another place. The foal ought to receive a dose

of castor oil, with a drachm of carbonate of soda and ten to twenty drops of chlorodyne, in a little tepid water. Half a drachm of the carbonate of soda and the chlorodyne may be afterwards given twice a day in rice gruel, made by boiling rice to a jelly. It may be necessary to withhold a portion of the mare's milk, and give this rice gruel instead. The foal's body should be kept warm and dry, and the hind quarters and legs clean.

Sometimes mares give too much milk, and if the foal is allowed unlimited access to it soon after birth, its digestion may become deranged; as a matter of precaution, a portion of the milk should be drawn from the udder before the foal is permitted to suck, but this need not be continued for more than a few days.

The period of weaning will depend upon circumstances, such as the quantity and quality of the milk the mare yields, her constitution and condition, and whether she is again in foal. The age of the foal itself is also a matter for consideration, but, under ordinary circumstances, it is generally agreed that September is a good month in which to take the foal from the mare, though, in this, allowance must be made for foals which are born early or late. Weaning should be a gradual process, and should inflict no injury on dam or progeny. Foals begin to eat oats at a very early age, and they should be encouraged to do so very soon, especially when two or three months old. Crushed oats are preferable to those which are whole, and if these are scalded and mixed with a little bran and boiled linseed, and a small quantity of salt, all the better. The quantity of oats that should be given will, of course, vary with circumstances, but more will be required after weaning than before. After weaning, if the foal is robust it will consume about two quarters of oats daily, and bran mash twice or thrice a week are not to be neglected. Beans have also been highly recommended before and after weaning, one authority asserts that half a pint of beans, gradually increased to a quart per day, supplied before weaning, will be of greater benefit than triple the quantity allowed at two or three years old.

It is bad policy stinting young foals in their food, and a liberal allowance of that which is nutritious and suitable for vigorous growth is always profitable. More especially is this the case during the first autumn and winter after weaning, when good feeding is absolutely necessary to enable the young animal to withstand the weather, and to compensate for the loss of the mother's milk.

It has been observed that worms sometime annoy foals exceedingly when they have attained the age of three or four months, or even earlier, but more particularly when they are yearlings. An examination of the faeces will generally reveal the presence of these parasites, while the appearance of the young animals—their staring, harsh, and unthrifty-looking coat, longer than it should be, large pendulous belly, loss of flesh, with frequently a dry, husky cough, and constipation alternating with diarrhoea—betrays the effects of the worms. The foals should have access to rock salt, and small doses of powdered sulphate of iron given morning and evening in a little mash, 10 to 15 grains of calomel given in mash, and repeated after an interval of ten or twelve hours, is a very effectual remedy, from 4 to 6 oz. of linseed oil being administered six hours after the last dose.

Warm and comfortable shelter dur-

ing cold and wet weather, and attention to feed, will ward off many of the maladies to which young foals are otherwise liable; but there is one disease which, if all accounts are true, is on the increase, and is sometimes very destructive to foals soon after birth, but does not appear to be much influenced by the conditions in which the animals are placed. It manifests itself by high fever, intense inflammation of the joints, more especially those of the knees, stifles, and hocks, running on to formation of abscess and ulceration of cartilage and bones. The pain and suffering cause rapid emaciation, debility, and death. Little can be done in the way of curative treatment, but much may be accomplished in the way of prevention. The cause of the disease is the entrance of specific germs into the wound at the navel, or end of the navel string, before this has completely healed up after birth, and to prevent the admission of these dangerous organisms the greatest cleanliness is necessary, not only of the wound itself, but of the stable or shed in which the mare and foal are kept. If a number of foals are reared in the same establishment, the appearance of the disease should be the signal for immediate attention to the others. This should consist of daily dressing of the navel cord or sore with some disinfectant, such as carbolic acid and olive oil, one part of the former to fifteen of the latter, applied with a bit of sponge. Or, after the wound has been cleaned with tepid water, the part should be well covered either with powdered boracic acid or equal parts of iodoform and starch powder, and covered with a piece of carbolised lint or fine tow, maintained in its place by a wide cotton bandage round the body. In about a week there will be no more danger. This treatment should be resorted to soon after birth.

Whether young foals are reared in straw yards or at pasture, or both, the hoofs require attention, and more especially in straw yards, where they are inclined to grow long and irregular in shape, which, again, is apt to react upon the limbs and cause their deviation from a good direction. A little judicious management here may save much trouble and disappointment afterwards.

When foals run about on very hard ground, not only are the hoofs sometimes too much worn and the feet consequently tender, but the concussion may injure the bones and joints of the limbs, and it is probable that some of the diseases of these which are supposed to be hereditary may be originated in this way in early life. "Cecil" many years ago, drew attention to the damage sometimes done to the hoofs from hard, dry ground, and recommended that a couple of barrowfuls of clay or soil retentive of moisture should be deposited in a part of the yard or paddock where the manger or receptacle for food is placed, so that the foals might stand in it during the time of feeding, this soil is to be kept soft with water when moisture is required, and a little common salt may be occasionally sprinkled on it with good effect. In many cases the clay may be dispensed with by merely throwing water on the spot where horses stand to feed—that is, unless the soil is very sandy and dry.

The desirability of accustoming foals at an early age to have their legs and feet handled must be evident, and in practising them to this manipulation progress will have been made in teaching them to allow their hoofs to be trimmed and regulated by means of the knife, or, better, the rasp.

## Swine.

## THE SWINEHERD.

## It Pays to Market Wheat as Pork.

The American hog furnishes a solution to the problem of a more diversified form of farming especially until the orchard and hop yards of the state come into a bearing condition. Hog raising seems to be the most promising industry open to the farmers of Northern Idaho. Farmers have hesitated because ignorant of the value of wheat as a food. Many of the farmers of the Western states were reared in the corn belt of the country. They have been so accustomed to feeding corn it is difficult for them to understand the feeding value of other grains. It is true that wheat cannot equal corn as a producer of fat, but it has been thoroughly demonstrated by a dozen experiment-stations and by scores of practical farmers that wheat and certain of its milled products are far superior to corn as a food for young pigs. Corn-fed hogs are always dwarfed in size. Wheat-fed hogs have a larger bone, a stronger framework, more blood and better digestive organs. These are the things that make a hog. Corn-fed hogs are so excessively fat that a reaction has set in against the use of such pork.

Prof. Atwater, the highest authority in the world on food questions, says: "Our diet is one-sided: the food we eat has too little protein and too much fat, starch and sugar. This is due partly to our large consumption of sugar and partly to the use of such large quantities of fat meats. One-half of the disease which embitters the middle and after part of life is due to an excessive and one-sided diet. Can we not cater to this demand and furnish a high grade of pork of fine flavor and free from excessive fatness? Wheat will do the work. (1) Prof. Henry of Wisconsin has shown that 5½ lbs. of corn meal is required to make 1 lb. of dressed pork and that the same gain is made by 5½ lbs. of wheat shorts. Sanborn of Utah found that 3½ lbs. of wheat will produce a pound of gain. The Washington agr. college found in a one-month trial that 4 lbs. of wheat would produce a gain of one pound. Throughout the Eastern states farmers are now extensively feeding wheat as a substitute of corn.

An Indiana farmer sold a portion of his wheat at 60c; the remainder he fed to hogs and realized 96c. Many farmers of Morrow Co., O., received 75c a bu for wheat by turning it into pork when the market price of wheat was 50c. The Armours, Swifts and Fairbanks of the next decade will live on the western side of the continent. Until these conditions are fulfilled farmers should co-operate and establish small packing houses and try hogs as a remedy for dull times and cheap grain.

*Farm and Home.*

**A Sow in Perfect Health** will never eat her pigs. Constipation or indigestion is the direct cause, being caused by improper feeding. No harm will be done the swine in giving them the run of the feed lot with the other stock, horses and cattle. Give them a corn ration with an occasional feed of bran and ship stuff. If it is where they can get it they will occasionally chew on fodder and corn stalks. Three or four weeks' run in the clover field before farrowing will bring them through all right. It is

(1) And so with pease.—Ed.

not unusual for a sow to eat a pig that has been crushed or born dead, and we are not alarmed to see them do it, but prefer to have their systems in such a state of perfect health that they will have no relish for this kind of food. If sows have the run of pasture or wood lands while in farrow they will seldom if ever develop this habit. The farmer that is compelled to keep his sows in a dry lot must make an effort to bring about the same conditions that the sow has while on pasture, must put before her food that will produce the same results. The serious objection to the small or dry lot rests in the inability to secure an abundance of exercise, which is a prime factor in the production of a healthy embryo. With a dry lot and sufficient corn to keep the sow contented almost certain disaster will follow at farrowing time. But with a ration of wheat, or if wheat is not fed use bran and ship stuff, along with collar and kitchen refuse or waste, such as potatoes, apples, pumpkins etc., we should have no fear that the sow would destroy her pigs, especially if she can have the run of the feeding lots, and take exercise by gathering the wastes. An occasional blade of fodder, a clover burr, leaf, or stem, all help in keeping the system in condition. Wood ashes and salt are necessary adjuncts in securing health. The sow needs the properties found in the ashes to aid in building up the bone formation of her young. If wood ashes cannot be had a small amount of ground bone in the feed will answer the same purpose. But when the food is rich in muscle and bone-forming properties the farmer need not be particular to add these things from other sources. However no better aid can be given the system to get rid of unhealthy tendencies than a box of wood ashes constantly in reach.

*Farm and Home.*

**Symptoms of Hog Cholera** are thus described by the Iowa state board of health: "The presence of the disease is indicated by a cold shivering, lasting from a few seconds to several hours; frequent sneezing, followed by a loss of appetite; rough appearance of the hair, drooping of the ears, stupidity, attempts to vomit, tendency to root the bedding, to lie down in dark and quiet places, dullness of the eyes, often dim; sometimes swelling of the head, eruption of the ear and other parts of the body; dizziness, laborious breathing, vitiated appetite for dung, dirty and salt substances, accumulation of mucus in inner corner of the eye, discharge from the nose, fetid, offensive odor of the discharge from the bowels, offensive exhalations, diarrhal discharge are semi-fluid, of grayish-green color and often with blood. In many cases the skin on the belly between the hind legs, behind the ears and even on the nose has numerous red spots, which toward the fatal termination turn purple. As the disease progresses the animal becomes sluggish, the head droops, with the nose near the ground, but usually will be found lying down with the nose hid in the bedding. If there has been constiveness, about two days before death there will be offensive discharges; the voice becomes faint and hoarse; the animal is stupid, wrination increases rapidly; the skin becomes dry, hard and very unclean; there is a cold, clammy sweat, and death soon follows, with convulsions, or gradually by exhaustion without a struggle. In chronic cases, or those of long duration, the animal becomes weak, lies down most of the time, eats but little

and has the diarrha. These cases may linger for weeks, scattering the poison of the disease in the discharge wherever they go."—*Farm and Home*

## The Grazier.

## Opinion on Feeding Stuffs.—Old Subscriber.

I shall feel greatly obliged by an opinion in your next week's issue of the comparative values of the following feeding-stuffs, taking into account their manurial values:—Linseed cake 8.0d. per lb.; lentils, 5.4d. per lb.; beans, 8.1d. per lb. [You should have said for what stock and for what purpose. It is no use attempting to answer your question, as we do not even know if the food is for fat or lean stock—cattle or sheep, ewes or lambs, calves or cows. You do not say if your beans or barley are English or foreign, or if your cotton cake is decorticated or undecorticated. The differences in standard composition are of such a nature that while one sample of linseed cake might be of superior value to a sample, say, of beans another might be inferior. You can only arrive at a conclusion on each sample separately, and at each price quoted. If you suppose that comparative values can be worked out into decimal places from tables of analysis, we are afraid you will be disappointed. We should advise you to make a trial and watch the results; and also if you put a definite issue before a competent agricultural chemist, with samples, his advice will be useful.]—*Eng. Ag. Gazette.*

## NOTES ON RAPE GROWING.

*By Professor Thomas Show.*

I have been greatly interested in reading the reports in reference to rape culture in the November issue of *The Nor'-West Farmer*. I feel much gratified to notice the results. The season was unfavorable and yet the judgment formed by those who tested the rape was quite favorable. I was specially interested in the report of Jacob Scott, sr., of Brant. What more particularly arrested my attention was the number of times he pastured the rape. I have known of its having been pastured off twice, and have heard of its having been pastured three times, but never before did I hear of its being pastured five or six times from the one sowing. If it will stand that in Manitoba it will certainly prove of great value as a fodder plant.

The unanimous verdict given by those who have tried it, as to its feeding value, is only what I should expect. There need be no question as to its utility in providing food for cattle, sheep, swine and poultry. The only question of vital importance is, how can it best be grown? My conviction is that under the present system of rotation, rape will be grown with most advantage on the bare fallows. These should undoubtedly be plowed early in the season. Probably it would be better to plow them the preceding autumn. (1) They should be worked frequently or at least occasionally on the surface to secure conservation of moisture to sprout the seed when it is sown. Two modes of sowing may be adopted. The first is to sow broadcast, and the second to sow in rows on the level. I do not recommend sowing in raised drills in your country, owing to the dryness of the summers and the looseness of the soil. If the bare fall-

(1) Of course it would.—Ed.

low has been stirred occasionally up till the time of the sowing of the seed, I should imagine that broadcasting would answer every purpose, and here I may mention that when giving surface cultivation, I can believe that good results would follow from the use of the roller immediately after the stirring of the soil, to prevent surface evaporation.

In dry seasons there can be no question of the advantage of sowing in rows, and cultivating. The cultivation would be attended with the double advantage of playing havoc with the weeds, and of more completely retaining ground moisture for the use of the plant. But the cultivation should be shallow, or surface evaporation will be encouraged. I can imagine that in favorable seasons great crops of rape can be grown on your bare fallows, but mark you, farmers, the land will have to receive careful attention up to the time of the sowing of the rape. The effort should be made to send as many of the weeds as possible to the land whence they shall never return, before the rape is sown, otherwise they may come in large numbers in the broadcast rape.

The only objection to sowing in rows is the labor of cultivating but I can imagine that the farmers of Manitoba could have this labor done, generally speaking, before the ripening of the wheat. Such a mode of sowing rape would be greatly helpful to weed destruction, since it would not only destroy weeds growing at the time of the cultivation, but it would encourage the germination of other weed seeds, and these in turn would be destroyed.

One reference in the reports I do quite understand. Rape is represented as being easily injured by frost. This is not in agreement with my experience or observation in growing the plant. It is injured by hard frosts, but slight frosts, or even pretty severe ones, do not seriously injure it in Ontario. I have often seen sheep feeding upon it amid the snow.

The best time to sow should be carefully considered in Manitoba. It is important to sow in time to secure germination, and yet if sown too early the hot winds spoken of would injure it. But I imagine that these hot winds are rather exceptional. The hot winds that cause rape to wilt will also injure wheat. Cultivation will prove a good antidote to the injure threatened by the hot winds.

It is all important that good seed be secured and true to name. To make sure on this point, some of your seedsmen should import a goodly quantity of the Dwarf Essex at once. (1) They should then prove it by growing it in greenhouses, and when thus proved, they could advertise accordingly in the agricultural papers. When thus guaranteed, a ready and large sale of seed would be likely to follow. I would suggest to farmers not to buy unless the merchant will guarantee the seed true to name.

The pasturing of the rape where it grows will be a grand thing for the land. It tends to impact it for the following crop and it also enriches it. The frosts will kill the rape, so that it should not give any trouble in the following crop.

Now, farmers, give careful attention to this question. It is an important one for your country. Proceed cautiously, but be sure and investigate. The question is being studied in Minnesota, not only by the farmers, but it is being investigated at the very excellent experiment station here, where the conditions are not very far different from those in Manitoba.

(1) Cole, i. e., colza is just as good.—Ed.

SHERBROOKE EXHIBITION.

Final arrangements have been made with the different railways for a special train service, and the association is to be congratulated upon having obtained much better train service, rates and excursions than have ever before been granted in connection with the Sherbrooke Fair.

The Great Trunk will run special trains daily from Richmond connecting with points on the Quebec line and returning at 6:15 in the evening, and connecting with points as far as St. Hyacinthe and Arthabaska. The Canadian Pacific Railway will hold the Megantic local every day during the week until six o'clock, and will run in special trains from Parham connecting at all points and returning the same evening, at 6:30. Good connections will also be made from all points this side of Gorham on the Grand Trunk to return the same night.

The Boston and Maine will run special train service as far south as St. Johnsbury, and the Maine Central have made arrangements to run two special excursions by way of Colchester and the Canadian Pacific Railway, and all the roads have given exceptionally low rates.

More entries have been received for the main building can be well be accommodated and in all classes of live stock, etc., the entries are pouring in thick and fast.

Never were there brighter prospects for a gigantic success than for the coming exhibition.

HENRI MARTEAU

The Great French Violinist.

Montreal, April 7th, 1891.

Mr. L. E. N. PRATTE, Montreal.

Dear Sir,

Permit me to thank you for your courtesy in supplying me with one of your own pianos for my personal use while in Montreal. I cannot leave without expressing my appreciation of the merits of so beautiful an instrument, I was much impressed with its magnificent tone and delicate touch which appeal at once to an artist.

Allow me to remain, my dear Mr. Pratte, Yours very truly,

HENRI MARTEAU.

Laval Veterinary School,

The French Veterinary School, affiliated to Laval University, will reopen for the autumn lectures on the 3rd of October next. The Government has been pleased to grant thirteen purses, which will enable the first applicants to a three years' term of lectures free of charge. This decision has been arrived at in order to promote the study of veterinary art in this province and also to assist poor students.

Faculty of Comparative Medicine and Veterinary Science, MCGILL UNIVERSITY.

The lectures in this Faculty will commence on Monday, 1st October, when the opening lecture will be delivered by Professor Adams. The matriculation for all students including those who are applicants for the Bursaries given by the Provincial Government, will be held on the 28th September, at the Faculty room, No. 6 Union Avenue.

The wide spread reputation of this School of Veterinary Science attracts students from all parts of the United States and Canada, and her graduates are found occupying the highest positions both as practitioners and teachers, many of them having obtained eminence as scientific investigators. The growing importance of this Faculty's work is daily becoming more appreciated and we hope to see many more of the young men of the Province avail themselves of the advantages it offers.

NOTES AND NOTICES.

We take pleasure in calling attention to the advertisement on the front page, of the Manufacturers Life Insurance Company whose progress not only in this Province, but throughout the Dominion, has been without precedent. The following names of the Board of Directors for this Province are sufficient guarantee as to the high standing of the company:—Robert Archer, ex-president Montreal Board of Trade; J. D. Rolland, vice-president, La Chambre de Commerce; Hon. J. A. Ouimet; A. G. McBean, grain merchant; A. F. Gault, of Gault Bros; R. McLennan, M.P.; Wm Strachan, vice-president, Banque Ville-Marie, et D. D. Mann, Railroad contractor.

The endorsement policies of this company payable in 10, 15 or 20 year prove a good investment.

If you are interested in farm machinery you would do well when visiting the exhibition of Quebec Fair this month to carefully examine the exhibit of Massy-Harris Co. Limited.

They build Seeding, Cultivating, Hay making and Harvesting machinery of most improved design and workmanship. They are satisfied with nothing but the very best. The immense sales and increased popularity of their goods are the best proof of their success in meeting the needs of the farming public.

Mr. J. N. Duguay, of LaBaie, will show the working of the Kilsbain Patent Wire-Fencing Machine at Quebec Exhibition. An inspection of this fence and the method of its manufacture will be of interest to all farmers, dealers, etc. A man will be on the spot to set machines and parish rights and also to book the orders for the wire fence.

The Dominion Dairy Supply Co., managed by our friend Mr. J. de L. Tache, will operate a fully equipped creamery at the Quebec Exhibition. The "Alma-Lava Cream Separator," the leading machine in this line, as well as several new inventions, steam turbine separators, the newest hand centrifugal improved power butter workers, &c., &c., will be shown in operation.

Intending purchasers for dairies or private dairies, are specially interested in visiting this exhibit on. We are assured by Mr. Tache that no such working dairy has ever been seen at any Canadian fair.

Mr. Wm. Tait, of St. Laurent, will not exhibit this year; he commenced the preparation of some fine pigs, but owing to the delay regarding the Quebec Exhibition, decided not to proceed and turned his stock out. He has some very fine animals that would surely have made their mark.

The pigs he sold this year have given every satisfaction judging by the number of litter from purchasers requiring for more.

In August number, Messrs. W. Gordon & Co., announced a special offer of cheap scales to subscribers of the Journal; but in 10 lbs. butter scales, the price should be \$3.80 instead of \$3.50. The 240 lbs. "Union" the price should be \$5.20. This notice is necessary owing to the demand for these sizes consequent on the publication of the offer in the Journal. All orders sent in during August have been or will be filled at prices published.

We are pleased to announce that in connection with the Provincial Exhibition at Quebec, the Rechebieu & Ontario Nav. Co., are extending to their patrons an opportunity of visiting the exhibition at greatly reduced fares on Sept. 12th and 13th.

For this occasion, they are retaining their grand orchestras on their steamers and which will add greatly to the entertainment of passengers during the trip. On the day of the excursions steamers will leave Quebec later than usual thus giving visitors to the fair ample time to reach steamer. For further particulars apply to local agents.

Messrs. Anthon Christensen & Co., whose advertisement appears in another column, draw attention to the advantages possessed by their "Capital and Labor" brands of belting for fast running machinery for which they claim their one inch wide cotton flat belt transmits more power than 3/4 diameter rope belt, and will last three times as long—and a cream separator, or any other fast running machines, can be run up to a higher speed with a 4 ply flat cotton belt with one third less power than any other belt on the market today.

The great advantage of using "Capital and Labor" 4-ply brand of belting is because it is the only real endless belt, made, no splice or joining whatever and, being finely woven it is remarkably pliable thus enabling it to adhere closely to the pulley and transmit 25 per cent. more power than any other belt as it is much lighter, weighing 45 per cent. less than oak-tanned leather or raw hide, while much stronger, and will wear longer than either as every foot of the belt is the same weight and strength, making the speed and strain on the machine always uniform.

They also manufacture a perfectly Endless Rope Belt to which they wish to call special attention, being the only real Endless Rope Belt on the market, and when you consider the wonderful service they give, while costing a little more at first, in reality are far cheaper in the end.

Users should apply for their price list and catalogue address Anthon Christensen & Co., P. O. Box 543, Suspension Bridge, N. Y.

MILK and Cream will sour and curdle unless you use the FINEST KEWALINE. It's cheap and keeps milk and cream fresh and sweet five to seven days, without ice. Successfully used for 17 years. Sample Free. Address J. A. McDonald, P.O. Box 127, Montreal, Canada.

DOMINION PRIZE HERD PURE BRED AYRSHIRE CATTLE

RECORD FOR 1893 54 PRIZES 37 FIRST - 11 SECOND

Gold Silver and Bronze Medals MONTREAL, TORONTO, LONDON AND OTTAWA

This herd has always taken the lead, they are of large size, and of good milking strains. JAMES DRUMMOND & SON. PRINCE COLE, MONTREAL, P.Q.

CHAMPION EVAPORATOR For MAPLE, MOLLUSK, CIDER, and FRUIT JELLIES. Has a corrugated iron cover, doubling boiling capacity; small interchangeable syrup pans (connected by siphons), easily handled for cleansing and storing; and a perfect automatic Regulator. The Champion is a great improvement over the Cook Pan as the latter was over the latter iron kettle hung on a fence rail. Catalogue Free.

THE G. H. GRIMM MFG. CO., HUDSON, Ohio, & MONTREAL, Quebec.

\$40,000,000 If you are an INVENTOR that the Bell Telephone PATENT has paid \$40,000,000 in 1891. To acquire a good PATENT, apply to J. A. MARION, Civil Engineer and Mechanic, No 185 St. James Street, Montreal. 9-94-121

ASHTON GRANGE HERDS IMPROVED YORKSHIRE.



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All my Young Stock are sold. I am now Booking orders for Fall Litters. I ship to order and guarantee satisfaction. Personal inspection preferred. Wm. Tait, 3-91-61 St-Laurent (near Montreal.)

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Isaac Foster, lot 10, sixth concession of Kitley, tells me that he likes Herbageum for his calves better than anything else he has ever had, and considers it more economical than linseed. Wm. COCHRAN, Jasper, P. O., Irish Creek, Ont., Nov. 24, 1892.

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We fed Herbageum to calves with skim milk—one tablespoonful to about a gallon and a-half of milk—and we consider that they did better than they would have done on new milk without it. KILMAURS, Ont., June 16, 1892. HUMPHRY GIBSON.

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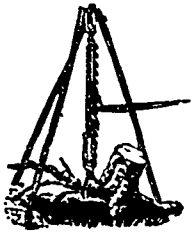
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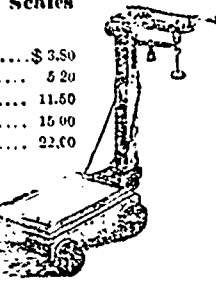
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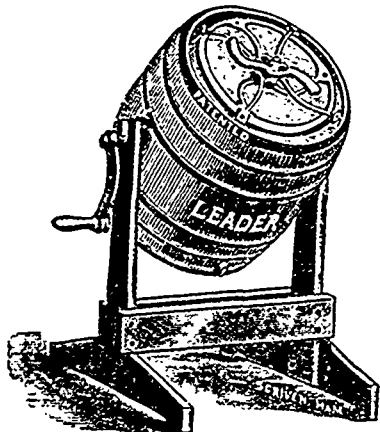
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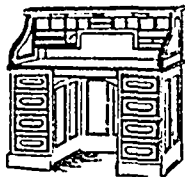
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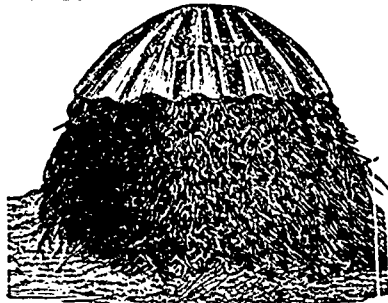
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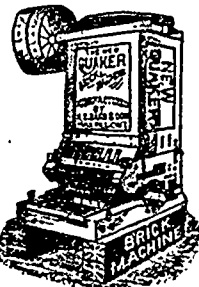


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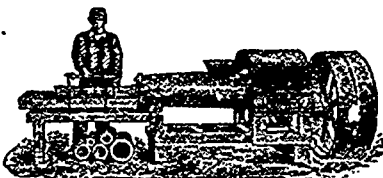


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