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THE ILLUSTRATED
Journal of Agriculture

Montreal, June 1, 1896.

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TO SECRETARIES OF FARMER'S CLUBS, &c.

We have been requested by the Asst. Commissioner of Agriculture to notify all Secretaries of Farmer's Clubs and Agricultural Societies that it is their duty to send in immediately the lists of their members, in order that they may receive the "Journal of Agriculture" from the beginning of the month of July.

COMPETITION OF AGRICULTURAL MERIT FOR 1896.

NOTICE,

The Competition of Agricultural Merit will be held in 1896 in the counties of Bagot, Beauharnois, Brome, Chambly, Châteauguay, Compton, Drummond, Huntingdon, Iberville, Laprairie, Missisquoi, Napierville, Richelieu, Richmond, Rouville, Shefford, Sherbrooke, Stanstead, St-Hyacinthe, St-Jean, Verchères and Yamaska.

In accordance with the regulations of the Council of Agriculture, all those desirous of entering into this competition must file their entry in the Department of Agriculture and Colonisation on blank forms that will be sent to them on demand by that Department.

During the last year or two, certain persons asked the judges to inspect their farms after the competition had been opened, under the pretext that they were not aware before that the competition was to be held in their district.

We are anxious that in future, there should be no misunderstanding on this point, so no entry will be received after the lapse of the delays fixed by the regulations of the Council.

The "Lauréats" who obtained the silver medal and the diploma of The Highest Merit, in 1891, must not forget that this year, they are entitled to compete anew for the right of winning the gold medal and the diploma of the Highest Exceptional Merit. Those who, at the above epoch, only won sufficient marks to entitle them to the bronze medal with the diploma of Great Merit or of Merit, may likewise compete again this year.

IMPORTANT OPPORTUNITY.

(From the "Quebec Diocesan Gazette.")

How often it is that men go right through life with a very imperfect knowledge of the methods which would enable them to farm to the best advantage. They work just as hard as the better instructed Farmer; but they do not obtain the same results, and the difference, which they lose, would be of course all profit.

Now it is in order to develop the capabilities of the Farmers of the Province of Quebec and to enable them to be more and more prosperous, that the Provincial Government has established several Model Farms, where young men are taught at little or no cost to themselves what will be of infinite service to them right through life. Already, the French Canadians are availing themselves freely of these advantages; and now, there is a new Model Farm

at Compton, which seems to be especially adapted to the needs of our English-speaking people. The Principal is Mr. John M. LeMoine (late of Stanstead, P. Q.) who tells me, in reply to inquiries which I have made partly out of my own desire to help our Farmers in all parts of the Diocese, and partly at the instance of the Honourable Louis Beaubien, Minister of Agriculture, that the Quebec Government has placed at the disposal of young men, who wish devote themselves to farming, fifteen Bursaries, which give to those who hold them, free board and tuition for two years.

There is, however, very wisely, a short probationary term of three months during which the Pupil has to pay seven dollars per month for his Board. But after three months, if he is approved by the Principal, he has a Bursary awarded to him, and has nothing further to pay. There are also money Prizes given for Ploughing, &c.

The new Building for the reception of Pupils will be ready by the 1st of July; the present House is full.

The instruction given at Compton is more especially in the best methods of practical farming; but, with this, there are to be theoretical and scientific Lectures, which will be given by competent Professors.

Young men are not admitted as Pupils under sixteen years of age.

Our Clergy would do well to bear this opportunity in mind; and our readers generally, who may feel interested, and who may wish to secure, for some members of their families, the advantages of sound training in the principles of practical Farming, with the help of one of the fifteen Bursaries, would do well to write at once to John M. LeMoine, Esq., Model Farm, Compton, P. Q., for further particulars.

OUR GRASSES.

Timothy—Perennial rye-grass—Orchard-grass—Meadow-fescue—Sheep's fescue.

The following description of the grasses that are of the greatest value to the farmer is derived from a bulletin by Prof. Shult recently issued from the Ontario agricultural department.

"Timothy, Herd's grass, Cat's tail." A perennial grass, coming early into leaf, blossoms in July. Stem long, erect and firm.

Suited to almost every soil, but succeeds best in land full of humus. One of the best hay-grasses; easily made, of excellent quality, and sells for the highest market price.

(Note). Good for horses, but not so suitable for cows and sheep.

As a pasture-grass, timothy is not good. The bulbous form of the roots exposes it to the attacks of insects, and renders it unfit for close feeding. It suffers greatly in droughts, and even in the best situations affords no aftermath to speak of.

The seed is abundant, and easy to thresh and clean. When sown alone, it needs 10 or 12 pounds to the arpent, (14 lbs to the acre.)

"Perennial rye-grass—Common darnel.

(Note). "Pacey's is the only "perennial" rye-grass that is trustworthy.

This grass is not to be depended upon in this county for more than one year, so is unfitted for meadows and pastures that are to be kept out several years. It blossoms in July. The stem

is from 2 to 3 feet in height, and the ears resemble the ears of couch-grass.

The grass is of good quality and in rich land the crop of hay is heavy, and not much inferior to timothy. From 30 to 40 lbs of seed to the arpent (35 to 46 lbs to the acre.

(Note). We never heard of any rye-grass being sown alone. If it were, the crop of grain after it would not be much. On a thousand acres of the finest land in Cambridgeshire, belonging to Mr. Nash, of Ochesterford, the production of grain was seriously diminished by the sowing of rye-grass by his son, who had studied in a farm in Scotland, and would not trust to the experience of some of the best farmers in the S. E. of England, that rye-grass would ruin his land. Any "grass" allowed to produce seed must unfit land for the growth of grain.

"Italian rye-grass" is best sown by itself for cutting green for cattle. Has it ever stood a winter in Canada? Three to four bushels an acre of seed.

ORCHARD-GRASS—COCK'S FOOT

"Perennial, very hardy;" coarse, rough stem. Answers almost every where, but of course prefers rich loams, and does better in the shade than any of the grasses. Blossoms at the end of June or the beginning of July. Has a tendency to grow in tufts and to smother other grasses; but is one of the best of pasture-grasses as it is early in the spring, keeps on growing all the summer up to the frosts, and stands drought well. It gives a good second cut, and will stand close feeding, but in a pasture full of this grass the parts that are not eaten down should be mown; it will then throw out plenty of young shoots. Not so good for hay as timothy, and should be cut as soon as the blossom begins to show, and even before, in fact, it can hardly be cut too early.

Sown alone, 3 bushels are not too much seed for an acre.

TALL OR MEADOW FESCUE—ENGLISH BLUE-GRASS

Almost the same plant, these two, but really two distinct varieties. Stem smooth and erect, 2 to 4 feet high. Leaves flat, long, and abundant. Blossoms about the end of June.

The fescues are hardy and perennial, and are chiefly valuable for pastures, though they produce a fair crop of hay. Seed, 35 lbs to the acre.

"Sheep's fescue". Stem smooth and slender, about one foot or eighteen inches high. There are many varieties of this plant. They do well in sandy soils, but are no good for hay; only worth sowing in poor, stony land; 20 lbs. of seed to the arpent.

(Note). It is all very well to talk about grasses being "perennial," but it must be borne in mind that no grass is likely to last long that is allowed to throw up its seed-stem.

(To be continued)

THE CROSSING of the PERCHERON AND ANGLO-NORMAN IN QUEBEC.

Foreign opinions—Degeneration—Canadian pony—Percherons and Anglo-Norman—Crossing.

Some time ago, a work, styled "A statistical account of breeding, rearing, forestry, and colonisation, in Canada," was published in Brussels; from this pamphlet we extract a few assertions, that are too rashly made to be passed over in silence, on the present

state of breeding horses in the province of Quebec.

After a few words on the history of the French-Canadian horses, concerning which we know positively nothing except that they came from Normandy, at a time when three breeds were then in vogue there; the Percheron, the predominant one, the Augeron, and the Merlerault-Cotentin; the author proceeds to say that the Canadian mares have been subjected to crossings of "even a detestable kind," leading to their degeneration, by the use of Percheron and Anglo-Norman stallions.

"Degeneration", yes, the word is there. As for telling us why three-fourths of the province are to limit themselves, according to him, to the production of the cob for local use, that he describes to us, and to leave to the other fourth, as in Ontario, the "degenerative process" that produces "the horse fit for the market, the author does nothing of the sort. He clearly belongs to the school, becoming less numerous every day, according to which our habits are not to try to breed horses for sale on the great Montreal market which supplies itself from Ontario or for that of the Northern States—that gets part of its horses from the Eastern Townships—but are bound to confine themselves to the breeding of good little horses for country use.

An error that would be costly and ought not to be allowed in these times when one has just seen such splendid exhibitions of horses at Toronto, and, again, at New-York, to say nothing about the five or six hundred picked specimens at the Montreal show! True, for our winter roads in the North, we ought to try to produce the Canadian "Morgan," on the St-Lawrence, for instance, the most useful of all our rural luxuries; but, just as we export our butter and cheese, so we ought to try to breed the style of animal now in demand, even in this bitter crisis; I mean the powerful draught horse with pace enough in his trot, and the high-stepping carriage-horse. These two styles, we are, partially, on the eve of producing through our Percherons and Normans, just as, in the Eastern-Townships, now almost the only exporting district, they began with the Clydes and a few Hambletonians. Do you need a proof of this? In spite of the loose (1) product of a first cross, look at the seals got by Brillant Blue and Clément, now stationed at Montreal and l'Assomption, or Holopheane and Maltôt, now at Montreal and Howick.

After an insinuation that the Percherons "are often of Belgian origin"! an allegation that was refuted so long ago as to be unworthy of our notice, the author at last speaks of the Belgian market—revived in part by the Ardennais horse. Now, the present Ardennais was bred by a double cross "métissage à deux" (some Anglo-Normans, among others, being used); which plan has been praised in our province for the last five years; the first results having been inferior, the second better, and the last remarkably good. And this is precisely what we wish to do in Quebec.

I shall not talk about the importation of Belgian horses; they have been tried in the States, and that point is settled. I will only add, that, written probably in a hurry, the chapter on horses in Canada puts forward sensible

(1) "Décousu," here translated "loose-products," we take to mean that the progeny of the cross has nothing defined about it. It means, literally, "unsewn, unripped."—Ed.

reflections on the peculiar breeding of the ranches, but concludes by entirely forgetting our Quebec breeders by the side of those of Ontario; though, indeed, we are not without breeders, only to mention one whose knowledge of the science of breeding is only equalled by his modesty, M. O. F. Bouthillier, of Ste-Thérèse.

In brief, we can recommend, after personal experience and specially after the experience of others, the following system of crossing to our breeders of horses, with an assurance of unexpected success, if they will first take into account the leading characteristics of their brood mares, and not make the following gradations an "absolute" rule. Be, therefore, prudent, and judge of the relationships (devinez les affinités).

A PERCHERON CROSS

1st generation: Canadian mare and pure Percheron stallion; result, say, a filly-foal 1×0.2 0.50.

2nd generation: This filly put to a half-bred Percheron of the country: result, say, a filly-foal 0.50×0.50 0.50.

3rd generation: This filly put to an English thoroughbred, if she shows hereditary signs of her dam: result, say, a filly-foal 0.50×1.2 0.75.

4th generation: This filly put to a $\frac{3}{4}$ or $\frac{1}{2}$ Percheron of the country: probable result, say, a stallion, sire of a settled breed, a fast-trotting draught-horse.

ANGLO-NORMAN CROSS

1st generation: Canadian mare, Anglo-Norman sire: result, say, a filly 1×0.2 0.50.

2nd generation: This filly, with a $\frac{3}{4}$ Anglo-Norman of the country: result, a filly 0.50×0.75 20.625.

3rd generation: This filly, with a pure pilot-trotter, or a thoroughbred, (English stud-book, Ed.) result a filly 0.625×1.2 0.812

4th generation: This filly, with a $\frac{1}{2}$ Anglo-Norman of the country: result, a "stock" stallion, able to beget showy, powerful and fast carriage-horses.

This is the style to give us reputation and wealth, two divinities that do not always run together: and these results, l'Assomption, Terrebonne, and Hochelaga, with their Percherons, one of which, Clément, is like a big Canadian; and Châteauquay, Chicoutimi, Terrebonne, Lac St-Jean, and Montreal, with their Normans; all these counties can, indeed they cannot fail to, obtain with time, patience, and above all, with perseverance.

R. AUZIAS TURENNE.

Montreal, March 10th, 1896.
(From the French)

Notes by the Way.

HOPS.—The ex-Bishop of Dunedin, at present Vicar of Preston, a village in the neighbourhood of some of the finest hop-gardens in East-Kent, England, sends us the following notes on the modern way of treating that plant:

"I read with much interest the Agricultural paper that reaches me from time to time especially the little references to the Editor's Kentish experiences. Your paper on Hop cultivation is hardly up to date. The best growers in East-Kent have taken to the wire and string plan. A new plantation of 7 acres has first been arranged on this plan, between the vicarage and the church, at a cost of 400 pounds. It is to be hoped the farmer will see his money back again. But the price of hops is at present ruinously low. We have had a marvellous winter,

i. e., none at all! Everything is abnormally forward, except the cherry trees, pease and plums which are not more advanced than in 1894."

It will be a long time, with poles as cheap as they are in Canada, before our hop-growers are obliged to resort to such a costly way of treating their hops: \$275.00 an acre!

WIREWORMS.—Did any one ever see the young grain plants on a "head and" eaten by the wireworm? No, not even when the rest of the field is scourged by these beasts, the head lands invariably escape. Why? because the pressure of the horses' feet in turning, when harrows and rollers are at work, prevent the wretch from travelling. Crushed rape-cake—not ground into meal, but broken to the size of a hazel-nut—has answered well. The pests gorge themselves and die from repletion: but there is no to be had here. "Rape-cake" is a good manure, so its application is, at any rate, not wasted; but we always found, in England, that a couple of rollings, with Crosskill's clod-crusher, or Cambridge's wheel-roller, stopped the wireworm's ravages better than anything.

ANALYSIS OF SOILS.—We have always held that any analysis of a soil, except by tests of the influence of manurial matters of different kinds upon it, after the practice of Mr. Georges Ville, was not likely to yield any valuable results. Professor Johnson of the Connecticut Experiment-Station confirms me in my opinion.

"Two samples", says he, "were sent to the Station for analysis; one taken from different parts of a 25 acre meadow, the other from a 4 acre lot; to ascertain what fertilisers would be the best for them. The former consists of black, moist earth, a foot deep, with some blue-clay below, on a gravel-bed. The question asked was: Why does not grass grow well on this soil? An analysis showed the presence of all the elements of plant-food, in sufficient quantities, and in as large a percentage as in some of the best wheat-soils of Illinois. Unfortunately, the analysis gave little information respecting the state of availability of the substances found, and gave no clue to the course of treatment for improving it."

As to the 4 acre lot, Prof. Johnson says that, after analysing the soil as represented by the sample, he can find in the figures no satisfactory explanation of its poverty. Everything required by crops is there. Some very rich Western soils are no richer in potash. We have no satisfactory means of learning the availability of the substances present.

FOOD AND FAT IN MILK.—Sir John Lawes, who is supposed to know as much about milk as most people, feeds his 30 shorthorn cows as follows: decorticated cotton-cake 4 lbs.; bran, $3\frac{1}{2}$ lbs.; hay, straw, and chaff, 14 lbs.; mangels, 80 lbs. Average yield of milk per day, 30 lbs.; and then comes the following emphatic statements: There can be no doubt that if the cotton-cake were stopped, the milk would fall off in both quantity and quality; I think you might produce a genuine very poor milk.

Dr Augustus Voelcker, now no more in this world, said in a reply to a question: In my judgment, it is the poverty of the food, rather than the excess of water you mention that the cows drank, that caused the milk of cows fed upon such food to become watery.

BREWERS' GRAINS.—Sixty-odd years ago, one of the great brewers at Burton, tried to make silage of brewers' grains. He filled twenty butts, 108 gallons each, with grains, hot out of the mash-tub, well trodden in by men, a sprinkling of salt every few inches a layer of spent hops over the grains, and a-top of all, a layer of moistened clay. At the end of twelve months, the butts were opened, and the grains were found to be as sweet as when they were "ensiled": for it was ensilement and nothing else, though the term was unknown then.

MANURE VALUE OF FOODS.—All calculations of the money value of the manure derived from the food given to cattle are based on the market values of nitrogen, phosphoric acid and potash. But it is very remarkable that the fact that only about half the manurial constituents of the food consumed is available to crops should have been commonly ignored in reports on feeding experiments. What is the use, too, of quoting the table of manurial value of Lawes and Gilbert, published some years ago, as if it were still authoritative, whereas, owing to the fall in the price of manures, the values given in that table are much too high. Sulphate of ammonia that in 1886 sold in Liverpool for £10. 10s. 0d., can now be bought for £8. 0s. 0d., (\$50.00—\$39.00) the ton of 2240 lbs.) Superphosphate that in the above year fetched £2. 13s. 6d., is now worth only £2. 0s. 0d. A fall, in the one case of 18 p. c., and in the other of 25 p. c.

Again, no one, we hope, supposes that a potential pound of nitrogen, or of phosphoric acid, is worth as much in farmyard dung as it is in sulphate of ammonia, nitrate of potash, or superphosphate; for MM. Lawes and Gilbert, in 1886, specifically stated in their table that all these calculated figures should be "halved", if the actual money value of the manure is in question. The object of this reduction is to cover two depreciating facts: first, the losses occurring to the manure before it reaches the land; and second, the best availability of farmyard manure to plants as compared with the artificial manures on the basis of which it is valued.

The nitrogen in farmyard manure is only partially available. Wagner, the great German experimenter, found that 50 lbs. of nitrogen in sulphate of ammonia, or 45 lbs. in nitrate of soda, produced the same effect on a crop as 100 lbs. of nitrogen in farmyard manure.

And yet some theorists try to make out that the money value of the manurial constituents of, say, cotton-cake, is even rather more than the market price of the cake itself!

RAPE.—Mr. Moore, of Moore's Station, writes us word that he intends to try a piece of rape for his sheep. Well, if he tries it properly, he will thank us for our advice. Sown about the 15th May, it should be fit for feeding off by about the 10th July.

LUCERNE.—The growth of this plant is already very astonishing. On the Seminary farm, a small "lisière", or border, of it, on the roughest piece of land, not half seed enough sown, in 1895, encumbered with stones, and unmanured, has made the following progress in 7 days. April 23rd, it measured 2 inches in height; April 27th, $4\frac{1}{2}$ inches, and, to-day, April 30th, $8\frac{1}{2}$ inches (1)

(1) And on May 15th, 20 inches, and was fit to mow for green-meat.—Ed.

And the weather has not been genial either. Clover, close by, has not started yet.

DAIRY-SHORTHORNS.—Well, at all events, the editor of the "Nor'-West-Farmer" is not a disbeliever in the merits of the Dairy-shorthorn. Speaking of an address made by Mr. Lynch (a County Galway man we presume), the editor remarks:

Mr. Lynch is both a breeder and a humorist, and his paper is rich in both elements. He would never undertake to prove that by any process now known or ever perhaps discoverable, a typical beef-cow could be made a superior milk-er. But he might reasonably contend that within the bounds of this favorite breed every variety now in demand can be found any day. It is well known that Molly Millicent, for three years champion of the English show ring, was a heavy milker, and Lady Bright, a 16-year-old cow, took a high place among milkers at the World's Fair. Thousands of capital milkers, nearly pure bred, are sold out of the north of England, with the combined aptitudes for heavy milking and ready fattening, making the best prices of any cattle on the English market, and always in demand. The steers, from such females, are known good feeders, and the females never fall of popular acceptance.

COMPETITION OF DAIRY PRODUCTS.

Dairy competition in Denmark—Manner of conducting it—Examination by experts—Quebec government's plan—Prizes to the successful competitors.

Those who read, and paid due attention to, the Report of MM. Gigault and Leclair on their tour of the dairy-countries of Europe, in the year 1894 will remember the remarks made by these gentlemen on the "Butter Exhibition in Denmark. It seems that the Danes, feeling dissatisfied with the results of these competitions, inaugurated a year or two ago a new system of emulation between the makers. In order to secure useful information as to the value of the butter exported to England, the Government now sends despatches to a certain number of makers, requesting them to forward, by the next train, samples of the last butter made by them for market. This butter must not be retouched after receipt of the despatch, but must be sent exactly as it was prepared for exportation, and, after having been kept for a few days at the government laboratory, it is examined by very experienced judges, appointed by the Chamber of Commerce, and subsequently analysed by a chemist.

After comparing the results of the two examinations, the names of the exhibitors whose butters are considered of the 1st and 2nd quality are published, but the other exhibitors are informed "by private letter" of the faults found in their goods.

Much benefit has apparently resulted from these competitions, as the uniformity of the Danish butters testifies. Experience has shown that all samples containing more than 14½ per cent. of water are of inferior quality.

It is only within the last 20 years that Denmark has made butter at all, and now it is the chief trade of that

country, and the source of the greater part of its revenue. England pays out every day about \$185,000 for imported butter, about one-third of which goes to Denmark. No wonder our good cousins, the Danes, look carefully after their dairy-work, and after their butter-makers too. We are informed that the patrons there will not keep any maker who refuses to take part in the competitions we mentioned above.

No wonder then that the government of this province should intend to profit by the experience of Denmark, and has determined to open a "Competition of Dairy-products" in June, and probably in July as well.

When the date and place of this competition shall be fixed, despatches will be sent to 50 to 60 proprietors of cheese-ries and creameries, requesting them to forward, "at once", exhibits of their goods, which will be examined by three judges, two of whom will be named by the government and the third selected by the Dairy-men's Association. Samples of these goods will be analysed by a chemist, and, as in Denmark, the names of the makers of the 1st and 2nd class goods will be published, and the other makers will each receive a private letter, pointing out the faults found by the experts with their butter

one of vetches to the acre, will pay you, in dairy products, far better than a scrawley crop of light oats. The "ar-pent" will require one-sixth less seed.

If you must sow oats, give the land a full seeding of four bushels an acre the plant will have no time to tiller.

HAY-MAKING.—Clover will be in a proper state to cut by about the 20th of this month in the western part of the province. Do not delay, but cut it at once, when the great majority of the heads are in bloom, let it lie till the upper layer is wilted, turn it, and when the new surface is also wilted, cock it, up and, unless it rains, never touch the cocks until you take them into the stack or barn. It is due to letting the crop stand too long and to fiddling about with the clover when cut, that the leaves leave the stem and become lost to the hay. In England, clover-hay is always worth from 5 to 6 dollars a ton more than any other hay. Here, the balance is on the other side. The second crop of clover, if the first is severed by the 25th of June, should be ready by the end of August, and the silo is the proper place for it.

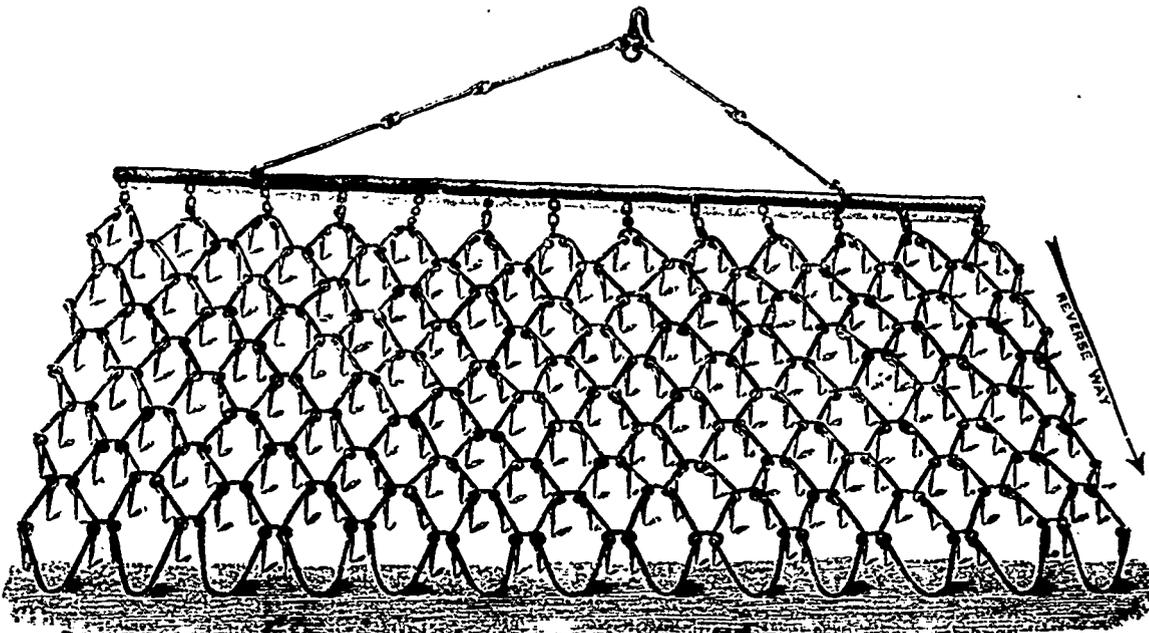
ROOTS.—By the middle of the month all roots, except white turnips should

more useful to all kinds of stock. It is worth any body's while to "see it growing" daily on the Seminary farm, in spite of the dry weather of the past month. We visit the "Islande" every afternoon, and it is no exaggeration to say that the perceptible growth of the 24 hours is marvellous; and yet the land is poverty itself. To us it is clear that lucerne is the plant for green-fodder for this country.

HUNGARIAN GRASS, may be sown at any time during the month. Plenty of seed, land well worked, and the roller to finish with, will almost invariably bring a good crop of this useful plant

ROLL ALL CROPS, after the plants are above ground, but not when, on heavy soils, the land is the least clung.

If heavy rains beat down the surface of fields in which grain has been sown and the sun has baked it, do not be afraid to pass a set of light harrows over it. The accompanying engraving will show the best implement for the purpose, but any chain-harrow will answer, or, in default of that very useful tool, any light common harrow. "Bread's weeder" we have never seen at work, but we hear a good report of it.



or cheese, and the best means of avoiding such faults in the future

The butter and cheese sent will be purchased by the department which will also pay the freight.

The first class will consist of those makers who shall obtain 95 to 100 marks, and the following prices will be awarded to the competitors of this class:

A silver medal to those who shall have won at least 97 marks and a bronze medal to those winning from 95 to 97 marks.

Five prizes, in money, will be given to those who shall obtain the greatest number of points in the second class, which includes those competitors who shall obtain from 90 to 95 marks.

FARM-WORK FOR JUNE.

GRAIN-CROPS.—As the season is a late one, and the ground by no means forward in preparation, we would advise farmers to omit the by no means judicious plan of sowing oats in this month, but to substitute some green fodder crop in place of the grain; maize, if you please, or the Sorel mixture of 2 bushels of oats, one of pease, and

have been sown, and the early ones should be ready for the horse-hoe. Keep it going, and, in singling the drill-row plants, mind that the man pulls the drills down well away from the roots, so that the obliteration of the raised drills may be perfect; the ground will then be level all over, and the effects of the droughts of July and August less prejudicial.—Why not sow all roots, except mangel, perhaps, on the flat? It must be better in a burning summer temperature like ours, one would think.

When the end of the month arrives, treat the headland of the root-field properly; that is, when the horse in the horse-hoe has trodden them down, break them up, harrow well, make them fine, and sow white turnips.

LUCERNE.—As far as we can see, the first cutting of lucerne will be ready by the 20th of May; (1) the second ought, if the weather is moderately favourable, be fit to cut about the 20th June. Remember, that this crop, like Hungarian grass, will not bear standing too long. When in full bloom, lucerne is almost valueless, but when cut at an earlier stage, there is no fodder-plant

(1) It was quite ready on the Seminary farm at that date.—Ed.

At all events, break the crust formed by the hot sun after the heavy rain; it is the cause of more "scalded" grain than anything else.

COWS.—Plenty of grass for the horned stock this month, that is, if there ever is plenty at any season. Unfortunately, our pastures seem to be the last thing thought of, and a month's grazing on an undivided pasture generally settles it for the rest of the summer

CALVES.—By this time, almost all the calves to be reared should be able to pick up their own living; but a mid-day meal of pease-meal or crushed-oats would do them an immense deal of good.

HOGS.—Of all ages should be "in-clover" by the tenth of this month; whether pastured on the land, or fed in the yard must depend upon circumstances. The young ones should have additional food.

SHEEP.—All the care the flock needs now is to see that they do not get fly-blown, and that their tail-ends are kept free from accumulations of filth. For fly-blows, washing and anointing with crude petroleum worked up with strong soap-suds is about as useful as

anything. In woodland districts in England we used to put "caps" on the sheep's heads, but before the fly begins its attacks, not after a sheep has been stung.

As for the "scab", as long as sheep are allowed to get so wild that they jump any fence in the country, so long will this contagious disease be incurable. Lawes' sheep-dip, after shearing will do much good to those infested with ticks, &c.

ARTIFICIAL MANURES AND THEIR USES.

By J. W. KNIGHT

(First prize—Exhibition of 1895.)

Plant-food—Nitrate of soda—Sulph. ammonia—Phosphates and super phosphates—Potash—Application—Effects of various manures on mangels, &c.

A great many elements are essential to the growth of plants, but the majority of these are present in most soils in sufficient quantities to ensure fair growth. We will consider fertilizers which supply the three most important elements, namely: Nitrogen, Phosphoric Acid and Potash, as they are the best known and universally used.

Probably the most used of all artificial manures is Nitrate of Soda, or Sodium Nitrate. Enormous deposits of the crude salt are found in Peru. Before being fit for use it is necessary to purify it, this is done by crystallization, common salt being the usual impurity. This manure is valuable solely for its nitrogen, it is an excellent manure for all cereals, roots and forcing crops. Its effects are especially noted in dry seasons, this feature gives it an advantage over other commercial fertilizers. It is well adapted for clay soils; the soda which it contains and leaves in the soil apparently helps to render the potash and phosphoric acid in the soil available to crops. It is very soluble and therefore very quick in its action, and should not be applied in very large quantities. (1) On account of its solubility it is liable to leach out of a reach of the plants before they have time to assimilate it. (Therefore, keep it atop.—Ed.)

Sulphate of Ammonia is another manure which is valuable for its nitrogen only. It is prepared from the ammoniacal products of gas works principally. It is highly important that it is free from all impurities before being applied. It is a powerful manure for corn crops. The ammonia is converted into nitrates in a few days or weeks after an application of the salt to a moist soil. It is well to remember that this manure produces little effect on soils destitute of lime, and should be employed only on soils of a calcareous nature. (1)

Bones, when finely ground up are a good manure, they decompose very slowly in the soil, especially on heavy land; their effect is thus spread over several years, the finer the bones have been ground the more immediate is their effect. They are valuable for their nitrogen and phosphoric acid and are a good manure for turnips.

GROUND PHOSPHATES.—Most phosphates (2) when finely ground may be successfully employed as manure

(1) Should be applied at twice.—Ed.

(1) There is enough lime "for the purpose" in 10 of all soils used for farming.—Ed.

(2) Except our "apatite."—Ed.

without being converted into superphosphates. They are valuable in Germany and Great Britain. The soils most suitable for such manures are those rich in humus or vegetable mould and deficient in lime. They are especially effective as a manure for turnips

SUPERPHOSPHATE.—This manure is prepared from the mineral phosphates which occur in nature by treating them with sulphuric acid, but space will not admit of our going in the chemistry of the preparation. As in other artificial manures it is essential that it be free from all impurities and its value depends on the percentage of soluble phosphoric acid present. Superphosphates form the basis of almost all manufactured manures. Mixed with Nitrate of Soda, it is an excellent manure for cereal crops, especially corn, but care must be taken in mixing, which should be done just before applying, or the superphosphate may be sown with the crop and the nitrate of soda applied afterwards as a top dressing. (3) It is also a splendid manure for cereals when mixed with Sulphate of Ammonia. Superphosphate is chiefly employed for turnips, for which it is invaluable. Turnips have not the power of assimilating the natural phosphates which are in the soil to any extent; thus the advisability of applying this fertilizer. When Superphosphate is applied to cereal crops it hastens maturity. (1) Gypsum or land Plaster is a splendid manure for such crops as clover and all other leguminous plants. It should be sown on the surface of the soil. If sprinkled on the tops of young turnip plants it is effective in checking the ravages of the flea beetle, (1) and its action as a fertilizer soon pushes the plants past all danger of them.

Slaked or Quick Lime has a very powerful action on soil containing vegetable matter, but it should be used with discrimination lest the humus of the soil be unduly diminished. (1) Heavy clays are also benefited by applications of lime is to render available the plant-food already in the soil without supplying any significant amount itself. Liming therefore cannot be successfully repeated except at considerable intervals. (good.)

POTASSIUM SALTS.—These are obtained from Germany and are valuable for their potash. Wood ashes, unleached, are also valuable as a potash manure, and should never be sold off the farm. We find ash-carts going through our country collecting ashes, and farmers actually giving away bushels of this valuable fertilizer for a few paltry bars of soap. Such practices should be discontinued. Potash manures produce their greatest effect on pastures, clover, potatoes and root crops. Clay soils are naturally furnished with potash and are not much benefited by such manuring. (Capital.—Ed.)

COMMON SALT OR SODIUM CHLORIDE, supplies no essential element of plant food. The value which it possesses is probably due to its action in the soil where it may help to set free more important elements. It is commonly used for mixing with nitrate of soda as a fertilizer for mangels.

A word may be stated as to the application. (3) The latter is by for the better way.—Ed.

(1) And nitrogen just the reverse.—Ed. (1) Any dust—road-dust for instance, does just as well.—Ed.

(1) Not much fear of too much lime being used here. We hear known of 200 bushels being applied to the acre, and no harm resulted.—Ed.

of the manures, which are readily soluble. A manure can be only beneficial when its constituents are brought into immediate contact with the roots of the crop. To attain this contact to the fullest extent, the manure must be thoroughly and evenly distributed throughout the depth of soil mainly occupied by the roots. Soluble manures, such as we have been considering have the faculty of distributing themselves within the soil after the first heavy shower far more perfectly than can be done by any method of sowing. When manure is especially required by the plant in its earliest stages, as superphosphate for turnips, it may be drilled in with the seed, but as a rule it should be sown broad cast and ploughed or harrowed in. Nearly all artificial fertilizers should be applied in the Spring, (good) and their effect is principally noted the first season after sowing. The amount of each of these manures which should be applied to an acre varies with the nature of the soil, the crop, the season, and the quality of the manure. Therefore this point must be decided by the farmer himself after carefully experimenting.

All commercial fertilizers should be purchased only on analysis; this is highly important and should be kept in mind when corresponding with dealers with intention of purchasing.

In conclusion we might state that the true economy of artificial manures can be understood only when we are acquainted with the special characters of the crops we cultivate. The composition of a crop is no sufficient guide to the character of the manure appropriate to it, even when we possess in addition the composition of the soil on which it is to be grown. It is not only the materials required to form a crop, but the power of the crop to assimilate these materials, which must form the basis of our judgment. (Very good indeed—Ed.)

When land is in a fertile condition the total amount of plant available is very considerable, and luxuriant growth may be obtained by supplementing the stores of the soil with the few particular elements of plant food, which the crop it is wished to grow has most difficulty in obtaining. (1) Thus, in a large majority of cases, a dressing of Sodium Nitrate and Phosphates will ensure a full crop of wheat, barley or oats, and in many cases Sodium Nitrate alone will prove very effective. These cereal crops generally find the supply of nitrates in the soil insufficient for their full growth and the supply of phosphates more or less lacking. But in the majority of cases they are well able to obtain a sufficient supply of potash and other essential elements of plant food. We are thus able by supplying one or two constituents of the crop, to obtain a luxuriant harvest. In the same way, Nitrate of Soda, employed alone, will, in most cases, produce a large crop of mangels; superphosphate alone, a large crop of turnips; while potash alone may be very effective with pastures and clovers. As the whole object of artificial manuring is to supplement the deficiencies of the soil in available plant-food, it is important that a farmer should ascertain by experiment just in what element or elements of plant-food his soil is deficient. And on this will depend the economy with which he is able to use purchased manures, which are too often wastefully employed. (Very good indeed—The only prize accorded to "Essays on Artificial manures", was decreed to this article.—Ed.)

(1) Excellent sense.—Ed.

PLOUGHING AND SUBSOIL PLOUGHING.

Ploughing-matches—Covering the sod — Feering — Water-farrows — Subsoil-ploughing — Drilling up land for roots—Learning to drive-plough.

There are indications that farmers in general are becoming more alive to the importance of good ploughing; its beneficial effects being apparent wherever comparisons can be made. There are many however in every part of the province who are decidedly careless about that part of their farming operations. But good ploughing can only be done by good ploughmen, and to be a good ploughman requires as much training and application on his part as would have made him a first class mechanic, or a professor in a college. The theory of it may be put on paper, but the training of the eye to measure size of furrow, to the fraction of an inch, the ready and spontaneous use of the hand to act in harmony with the eye, the training of the horses to answer a slight pull on the rein and go as wanted; with freedom of head from tight reining or tying back, are only acquired by persistent practice. These small details may seem unnecessary, but observation has convinced me that it is a part very much neglected, perhaps the best way of stimulating a spirit of emulation in the art of ploughing among our young men would be to have more annual ploughing matches, say in every parish; it might induce a spirit of friendly rivalry among them and bring more of them out as competitors.

The winning of prizes would be a small part of the benefit to them of these matches as the training necessary to excel in the art of ploughing would be likely to foster habits of tidiness and neatness in all their other work. The plough; that is, it has wooden handles, in this province at least, is the wooden plough that is, it has wooden handles, iron beam, steel mould board, and cast metal sock, the latter is cast aside and replaced by a new one when the point becomes worn, so as to lose its grip on the ground, this is often delayed from mistaken ideas of economy, till ploughing merges into grubbing or something of that sort. I may remark here that nearly all the ploughs in use at the present time, except those made expressly for sod, are very plain, a little higher cut would be better, either for stubble or potato-land, as there would be more shoulder on the furrow, more surface exposed to the action of the frost, and the harrows, would do better work on it in spring. I will now try to describe how ploughing should be done, and as there is some difference in the way of ploughing stubbles, potato-land, and sod, each will be treated separately. Beginning with sod, a high cutting plough is the best, as besides exposing more surface, the sod or grass can be all firmly covered, and thus will all rot. The crop next season will not be part timothy and part oats &c. If the ridge before ploughing is of good shape and the furrow of medium depth, about the same size of furrow can be maintained in ploughing most of the ridge. If the ridges are badly shaped, as from having high crowns, flanked sides and deep furrows (common faults) or sometimes the furrows are so shallow as to be hardly perceptible, but whatever the shape of the ridge or depth of furrow, the aim of the ploughman should be to leave his ridges when ploughed,

with very slightly perceptible round, and get its full share of the harrows. Should there be regals (1) through the field, it would be well to run the plough through them; also, at both ends of the ridges, throw the stuff into a cart with a fork and put it on the dung heap, it does not take long and makes a good job. Besides regals in a lea field are difficult to clean after ploughing if this is neglected. In making a start it would be well to plant three or four poles, so as to start straight, besides it is a good thing to learn to set poles well, quickly, and to go straight to them. The poles should be set 12 inches to the left of the old furrow, less or more according to the depth of the furrow, and width of plough underneath, so as to make two small furrows or scrapes from one to two inches deep, (according as the furrow is shallow or deep). In drawing off to the poles the ploughman will find use for all his hands.

As he has to drive his horses straight, steer the plough straight to the poles, and keep a uniform depth all at the same time. This can only be done well after he has got into the knack of driving the horses with such a light use of the reins that they scarcely know they are being driven. The scrapes should meet in the center of the furrow and touch but not overlap each other. Care should be taken in making the scrapes to set the coulter low enough to cut, not rag or tear them. Should the furrow be shallow, 4 to 4½ inches wide by the same depth, an ordinary furrow 5½ by 5½ will be found about the right size to make the crown; holding the plough in such a position that the feather or the sock will strike about the place where the scraping furrow was lifted: if well done the crown furrows will lie smooth and even about the shape of the roof of a barn, and touching each other. If they don't touch, the scrapes were too wide for that plough. If crowded, too narrow, the second furrows should be a shade thinner than the others following, but fully up to the level of the crown, the fourth and fifth, a little heavier than the third; but all about level with the crown. As when there is a flat, or low spot in the ridge it is generally, about the fourth and fifth furrow. A gradual but slight lessening in width, but not much if any in depth to the finish (unless necessary from the lie of the land). The ploughman should accustom himself to know by sight without measuring, when there are seven or eight furrows to plough, so he can make one less or more. To divide the land equally, counting the scouring furrow as one, which should be laid to the hinting furrow, as it is generally not pressed so firmly into place as the other, this can be done without loss of time of confusion till the field is finished. (1) It is a sort of puzzle, but not a difficult one, and need not be explained here. When the ploughman finds the width of scrapes that suits his plough, he should make several at once, if the ground is somewhat loose, covering one small furrow as in stubble is often done, but the sod seldom breaks evenly and gives the crown a ragged appearance. When a ridge is finished, if the crown is too high (higher than the furrows on either side a common fault) or flanked or uneven &c., the ploughman needs more practice.

Subsoil ploughing is very little practised, even by the best farmers, but it cannot be otherwise than beneficial es-

pecially on land with clay subsoil. I have in mind one field the soil being clay-loam flat, not drained and clay subsoil, that showed a marked benefit of one subsoil ploughing for several years after. Farmers that don't like to face the expense of underdraining could at a small cost do a good deal of subsoiling. It does not take the place of underdraining, but where the surface drainage is well looked after, good results will follow. The plough made for the purpose will I suppose do the best work, but an ordinary iron plough with mould board taken off, answers very well, and is I think, easier held. In ploughing stubble land, the first furrow is covered by the crown furrows, the subsoil plough following in the bottom of the furrow as deep as two stout horses can draw, following the first plough till the field is done. I would favour a heavier furrow in stubble than in lea, except on sandy land, as much care taken in shaping the ridges and making the furrows regular and even.

In ridging up potato land, or where roots or corn have been grown, it is seldom necessary to make them less than 14 ft. wide, that size can be sown by hand, and fits two widths of the ordinary harrow nicely. If the seeder is used, and the land naturally dry enough, 19 or 20 ft. would not be too much. Wide ridges suit the binder better than narrow ones, besides other advantages. Before beginning to plough, the whole field should be drawn off in ridges of the same width, beginning half a ridge from one side, set poles, 3 are sufficient and must be exactly the same length, so that in measuring two or three lengths will make the width of ridge wanted. Plant one at the end to be started from, another 2-3rds. of the way up, and the third at the other end in a direct line with the other two. Then, after measuring again with the first after measuring again with the first pole, plant for the next ridge, draw a furrow in a line with the other two stopping at the second before knocking it down, measure and plant like the first. There is but one pole left, but with a little practice the ploughman will learn to go straight to one pole. When the third pole is planted, turn the horses to the left, neither horses walking in the furrow but one on each side. Throw out another furrow in a reverse way to the first, and so on, till all the ridges are drawn off, then begin at the first and at the other end of the field as the first crown-furrow fits best on that side. To make a good shaped ridge on level land, care must be taken not to raise the crown too high. The first round should be light, increasing in size up to the fourth furrow. If the ridges are 14 ft. the fourth, fifth and sixth should be a little the heaviest of all, diminishing slightly to the finish. Otherwise, there would be a little flatness at the fourth and fifth furrow. If more than 14, keep up size accordingly. If when done, the ridge should have a very slight but uniform roundness, 5, 6 or 7 rounds may be put on each ridge before finishing between, but whatever number goes on first, the rest must get the same, else, the ridges won't be of equal width. Finishing as in lea, and always at the same end, there will be a few furrows left at each side of the field which can be finished by going round the field till done, the head lands, of course, ploughed like any other ridge.

As farmers, boys generally do a good deal of harrowing. Before trying the

plough, it should be taken advantage of in learning to drive the horses, as they should be driven when ploughing. They should practise driving straight from end to end with the least necessary use of the reins, or close tiring (tying ?) between the heads, turning the horses steadily at the ends, without their jostling each other, or overstepping the traces &c. He should be always on the alert to curb his temper, when it is like to break bounds, as the effects are bad both on the horses and himself. Beginners should as much as possible be started on summer fallow or land that has to be ploughed again. In being painstaking in his work, a ploughman need not get into the habit of being slow.

As seeing at a glance and deciding at once what to do, soon becomes a habit, time is money, and the best ploughman is the one who gets through the most work, in the best manner, with the least unnecessary strain on the horses.

NO NAME ATTACHED!

ESSAY ON CHEDDAR CHEESE MAKING.

Selection of milk—Rennet-test—Influence of locality, &c.—Stirring—Watchfulness throughout—Pressing—Dressing,

"Tempora mutantur nos et mutamur in illis."
HORACE

Perhaps no staple article of commerce has been subjected to so many and great changes in its manufacture within the past few years as has Canadian cheese, and as we review the work of the past twenty years and scan the present outlook we must confess that cheese making is much more pleasant in the retrospect than in the present reality of the future seeming.

Our present essay does not permit of more than a cursive glance at the past, and we may proudly compare the present with it, and so take courage and guidance for the future.

In the good old times, if a cheese had a little more consistency than butter, and somewhat of the shape of a cheese it passed inspection, the maker got through early, drew a large salary and lived royally, but now indeed "the time are changed we with them."

The cheese maker must not now be merely the platonian "animal bipedibus implume latis ungibus"; he must be the most rational of men, of quick judgment, logical mind and keen perception. The article he must now make is so "mercurial" that all kinds of milk may not enter into its manufacture. The time when it was considered impolitic to refuse sour, tainted, or greasy milk at the factory has passed away. Now the milk must be inspected on the wagons and improper milk rejected with that "suaviter in modo sed fortiter in re," which is characteristic of a man of whatever nationality he may be. When the milk is all in the vats, many considerations at once claim the attention of the maker. Has the milk sufficient acid? The rennet test is at hand and should be used wherever the least doubt exists, that he may know just how long he may agitate the surface after thoroughly incorporating with the rennet. How much rennet shall be used? This is a very important question and to solve it he must take many things into consideration. The influence of locality has much to do in deter-

mining this, the caseine, in some localities, yielding more easily and more perfectly to the coagulative action of the rennet than in others, a knowledge of the "timber" of the milk in his section is essential to obtaining a good average and that he may more perfectly understand it, he should keep a record of every vat of milk he handles. This should include every step in the manufacture and have a goodly space for foot notes and if he adds the specific gravity of the milk with the temperature at the different stages it affords a valuable book of reference.

Must the cheese when made stay in the curing room (often improperly constructed) for five or more weeks, or will they, if not sold within a month, be placed in cold storage? Of this he must be informed if he would act intelligently and if he must hold his cheese long in an overheated curing room, he must use rennet sparingly, even if he makes a poorer average thereby.

But this being settled, the greatest care must be taken in incorporating with rennet, steering the surface until within two minutes of coagulation when it should be perfectly calm, and no vibration allowed to reach the bearings of the vat. All instruments used in cutting the curd, no matter at what stage, must be sharp and not contain too abrupt a bevel; the curd (if the cheese is for commercial purposes only) should be cut into a perfect cube; for fancy cheese, without regard to average, a diamond grain apparently gives better results, but not sufficiently better to pay for the lost in average.

When the curd has been cut preparatory to heating, the maker has many highly extolled so called systems at his command, yet each one with that grave fault inherent in any and all machine work (which the systems really are) that they allow no scope for individual fancy or ambition, giving the maker no incentive to make a cheese better than any or all that have previously been made, nor taking into consideration the many and peculiar changes to which milk is so liable; and when he wishes to run the whey off ah! "There is the rub" The curd must possess a certain amount of firmness by the time it has gained a given amount of acid, and that amount of firmness must be given partly by heat and partly by muscular rather than molecular motion, and the maker must adjust these with the care and precision of a chemist in compounding a formula; the curd must be firm but not dry, so must the cheese, the cheese must be creamy but not soft, nor salty and must withal be close.

Yet, a little too much heat would cause a dry, chippy cheese and too much hand stirring would give a similar result, while too little heat would cause saltness, and in attempting to overcome this by a more liberal handstirring much of the fat would be expelled and that in the form of butter, some of it remaining in small cavities among the particles, a great amount of which would, doubtless, go out in the pressing and the remainder could not escape the buyers eye. In fact, the curd must be brought to a certain condition known only to cheese-makers and incapable of being defined by him or described, and this condition, in itself highly complex, differs in different localities, and with the change of seasons and yet the inventors (save the mark) of systems contend that with their system, failure to make a fancy article is an impossibility.

Nor can watchfulness be relaxed even when the curd has been piled and

(1) Is that the French "rigoles"—water-furrows?—Ed.

(1) The "hinting" furrow is what we call in England the crumb-furrow.—Ed.

(1) In most cases, subsoiling heavy land before underdraining does harm.

covered; some curds reaching the condition for salting in one seventh, yes, in one ninth the time required by others. My record for 1891 shows two vats, one of which was salted 4 hrs 11 min., after setting, and the other 4 hrs 37 min., yet these cheese were repeatedly pronounced "perfect" by one of the largest cheese manufacturers in this country, himself a strong advocate of a many hour system (verbum sap.)

Now it is most unwise, after toiling hard all day to allow the greenhand to finish up and do the pressing. To press curd properly, the master hand is required, almost as much perhaps as much as to stir properly. To the uninitiated handstirring seems to require only plenty of muscles, but cheesemakers to whom this essay is addressed, know that a greenhand will start the white whey from a firm curd, though a skilful maker would apparently handle the curd much more roughly, and would in fact handle it fully twice as fast without starting it. So, in pressing, a certain amount of pressure is needed to force the particles into place, but more than that will crush them, and more or less butter be forced out.

The dress of a cheese is now of more importance, a "full dress" is favored and in fact the bandage caps of circular form are a "sine qua non" to successful cheese making. These should be put on when the cheese are platted and slipped on the cheese. And if the cheese are pressed 48 hrs, which they should be, they furnish a perfectly slipper proofcovering. (1) So much for the present, what of the future? Good and better are ever inimical, and if we are to hold the prestige already gained we must look to our laurels. It is true we have dangerous rivals in Australia and New Zealand, let us not underestimate their abilities; their effect is already felt. Only by diligent care, by intelligent action, can we hope to retain our hold on the English market. The gods have not uttered their (not grec indelible) (1) and it is not too late to add some improvement, and cheese makers unions should be organized and encouraged not for the wretched purpose of enforcing exorbitant wages but for exchange of opinion and experience, to study and receive higher instruction in this important art, (for such it is) and in this we may well meet, for in this regardless of race or creed, our motto should be "Canada against the World."

GEO. E. MARTIN,

Bayside,
Ontario, Can.

Sept. 9th 1895.

FORMATION OF SOILS.

(Concluded)

**Fertility—Dormant elements—
Available do.**

We have seen that plant-food is of two kinds; "organic," or matter that can be rendered gaseous by fire, and "inorganic," matter which resists the attacks of fire. We can easily see that inorganic food must be derived from the soil, and as nothing can enter into a plant so long as it retains its solid form, it is clear that this inorganic matter must be derived from those parts of the soil which are capable of being dissolved, in chemist's language, so-

(1) The "shipper" is what we call a nitre?—Ed.

(1) The words in the parenthesis were inserted by the copyist at Quebec.—Ed.

table: plant-food must be made liquid by water, or it must be imbibed in the form of a gas. "Carbonic acid and ammonia" however, are associated with both groups, the organic and inorganic, and are received by plants from the soil when dissolved in water, as well as from the stores existing in the atmosphere.

"On what does the fertility of the soil depend?" To answer this question, we must first ask you to consider what you would think of being left on a desert island with nothing to eat but frozen meat, and no means of thawing it: "I have plenty of food," you would say, "but I cannot use it: I must starve." And so it is with plants. There may be any amount of plant-food existing in the soil, in a "dormant" state, but before it can be utilised by the plants you cultivate, it must be placed in an "active" state. Plant-food in a "dormant" (sleeping) or inactive state, is just as useless to the plants as a loaf of bread locked up in a banker's safe would be to a hungry man. The soil may contain all things necessary to supply nourishment to vegetation, but the plants may languish and die. It is only that part of the soil which is capable of being dissolved by rain water which is available as food. The supplies of food which are ready at any given time are those which determine the growth of the plant. Hence, in every chemical analysis of soils, it is absolutely necessary that the ingredients that are soluble in water should be distinguished from those that are insoluble; for it is of no use to the farmer to be told that there is a plentiful supply of any particular ingredient, unless that ingredient be in a fit condition to afford nourishment to vegetation.

But we must not imagine that the "dormant" portions of the soil are useless. By no means. They are the store which nature has laid up for future use, and keys have been provided by her, with which the skilful operator, aided by her own powerful hand, may open the lock of the great safe and set free the imprisoned riches. A bad husbandman may steal and carry off a most terrible proportion of the "active" ingredients of the soil, but it is only the good farmer who is able to avail himself of the "dormant" parts. I would far rather succeed a bad farmer on a farm than a good one, unless, owing to circumstances, the latter had to leave unexpectedly. The bad farmer might skim off most of the cream, but the good farmer would manage, in the last few years of his occupation, to take cream and cheese too, and thus repay himself for his outlay at the beginning of his lease.

And how does the skilful farmer set about ravishing these hidden treasures from the bosom of the earth? In two ways: passively and actively. We must, we fear, repeat many things in these "first steps"; but repetition is the parent of acquisition, and you did not learn your alphabet by glancing over it once. The rain-water, with its carbonic acid and oxygen, and the frost gradually break down the hardest rocks, and, in time, dissolve much of their finer portions. The same action takes place in an autumn-ploughed field. The air, the rain, the frost, work their will upon the soil, break it up into finer particles, and these little fragments are so acted upon by the elements, that the exterior portions of them become soluble in water, and fit to be taken up into the circulation of a growing plant. Thus you see that the farmer who knows his business "actively" prepares the road for nature's agents, and then "passively" waits

til the servants have done their mistress' bidding.

Time, you will observe, is everything in farming. Plants demand available food, and demand it at the instant: they can't wait, and they won't. There may be hundreds of pounds of "dormant" food to the acre on your farm, the plants care nothing for it: they want active food. If you go on drawing cheques upon a bank without paying in any deposits, you know what will happen: sooner or later your funds will be exhausted. And so with the soil: if you persist in demanding crops from the land without making any return, the land will, in effect, say to you: "You have taken all my ready-made lime or potash, how can you expect me to furnish your wheat or your oats with what I have not got? No, you must wait, you must pay me some lime or potash back again, and then I will try what I can do for you. You cannot live without prepared food, neither can the plants you cultivate."

As the soil is the only source from which your crops can obtain this inorganic food, it is as well that you should know what they remove from the land. In the following table, you will find as accurate a statement as the varying yields will admit of. You cannot remember all the figures, but you can form a good general idea of the facts they represent.

And what a difference there is, not only in the quantity of the same material demanded by the various crops, but also in the quantity demanded by the different parts of the same plant! For instance; it takes only 13 ounces of silica to suffice for 25 bushels (1500 lbs) of the "grain" of wheat; but the 3000 lbs. of "straw" which, in England at least, are required to produce the above crop of grain, demand 101 lbs. of silica, to enable the crop to stand against the heavy gales and rain, which about the time of harvest, do their best to hurl the hope of the tiller to the ground.

this reason: you may by heavy dressings of manure, get any amount of straw to grow up, bearing magnificent ears, but if there is not a sufficient quantity of silica in a soluble state to glaze and stiffen that straw, the whole crop will fall to the ground, and all you reap will be a few bushels of thin grain. And this is the principal reason why large applications of manure to exhausted soils so often disappoint the farmer: the other elements of plant-food are given, but the soluble silica, the strengthener is absent, or rather unready.

In short, you are to understand, that a superabundance, even, of all the other constituents of your crops is utterly useless, if one of them be absent, or from its condition, hard to come at. They must all be there, and they must all be in a fit state for the plant to feed on. There may be 2 p. c. of phosphoric acid available in the soil for the food of your wheat crop, but if the .30 of a pound to the acre of common salt be wanting, god-bye to your hopes of harvest. As the strength of a chain is measured by the strength of the weakest link in the chain, so the fertility of a soil is determined by the quantity of that essential food which is present in the least proportion, and not by that which is in the greatest abundance. A carpenter may have plenty of boards for the construction of a shed, but if he has no nails, the shed stands a poor chance of being built. Give him never so many more boards, and you help him not a bit. It is the nails he wants, and until he gets them he can make no progress in his work.

But land may be wanting in fertility for "mechanical" as well as for "chemical" reasons. A hard pan may exist, whether natural or caused by the constant deposit of iron detached by friction from the plough share, etc.; this will prevent the roots of your crops from penetrating to a sufficient depth, and in consequence, their range of pasture is so restricted that in a dry season they will wither away. The cure for

	WHEAT.		BRANS.		TURNIPS.		CLOVER.
	25 bushels.	3000 lbs straw.	25 Bush Corn.	2800 lbs. of Straw.	20 tons Bulbs.	6 tons. Tops.	
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Potash	7 49	18 91	22 63	89 17	125 73	75 95	52
Soda	9 97	4 90	6 68	2 76	22 98	16 23	7
Magne. s.	3 07	4 11	5 03	11 24	12 27	9 27	35
Lime	85	9 31	3 63	33 58	37 87	69 81	111
Phosphoric Acid	11 47	8 15	23 67	12 16	31 11	27 87	20
Sulphuric Acid	08	5 82	61	1 83	42 26	36 56	13
Silica	84	101 82	72	11 84	11 65	2 58	10
Peroxide of Iron	20	1 32	35	—	3 71	2 58	3
Common Salt	03	33	90	7 15	28 69	38 15	8
Carbonic Acid					21 71	21 00	
	25 00	150 00	63 00	168 00	310 00	300 00	259

Why should beans take from the acre of land on which they grow only 12 lbs. of silica, and wheat 102 lbs? The reason is obvious. Look at the stuff of which the straw of both crops is composed. The one is soft and woolly, the other hard and steely. Some grasses contain so much silica that the blades, will cut your fingers if they are drawn sharply through the closed hand. On the outside of a thoroughly ripe straw, or of a cane, you can absolutely see the bright glossy coating of silica. And this silica is one of the most important materials in the production of grain-crops; for

this is deeper ploughing by which the "pan" will be broken up, and the restriction removed. Water stagnant near the surface, thus excluding the air, is another cause of inferior crops; the water-level must be lowered by drainage, and then the air will obtain access to the soil and the growth of vegetation will be rapid, healthy and vigorous.

How to use Insecticides and Fungicides.

A TABLE TAKEN FROM A BULLETIN OF THE AGRICULTURAL COLLEGE OF MICHIGAN, AND ARRANGED FOR THE PROVINCE OF QUEBEC.

Farmers and all fruit-growers begin to see the need of protecting their crops by the use of fungicides and insecticides. We have tried to condense, in a few words, the manner of preparing and using these remedies, under the form of a table easy of preservation and consultation.

Explanatory Notes.—Although the number of applications, here recommended, may be useful in seasons when fungous diseases, due to mildew, are more especially severe, it will often happen that a smaller number of applications will suffice.

The asterisk (*) shows that care must be taken, when sprinkling plants or trees in bloom, not to overdo it.

The dagger (†) indicates that it is dangerous to use poison on fruit, and that at least three weeks or a month must be allowed to elapse between the application and the gathering of the fruit.

TREES OR PLANTS.	1st APPLICATION.	2nd APPLICATION.	3rd APPLICATION.	4th APPLICATION.	5th APPLICATION.	6th APPLICATION.
CHERRIES (Lice, weevils, worms, rust, smut.)	As soon as the flower-buds show, but before they burst, Bouillie-Bordelaise; for lice, Emulsion of petroleum.	When the fruit is formed use Bouillie-Bordelaise and Paris-green.*	10 or 14 days after, if the rust appear, repeat application.	10 or 14 days after, use the ammoniacal solution of copper carbonate. †		
CABBAGE (Worms, caterpillars, lice.)	As soon as the worms or caterpillars appear, Paris-green, petroleum emulsion or pyrethrum.	If they re-appear, Paris-green may be used, if the cabbage is not hearting.	When hearted, use salpêtre (a dessert-spoonful in a gallon of water) or pyrethrum.	Repeat, if the worms reappear; against the cabbage-grub, infusion of heleboro round the roots.		
STRAWBERRIES (Rust.)	Before vegetation begins in spring, Bouillie-Bordelaise.	Just before the flowers open, Bouillie-Bordelaise and Paris-green.	After the fruit is formed, ammoniacal solution of copper carbonate. †	Bouillie-Bordelaise, as soon as over fruiting, if the plants are to be kept on.	<i>Remark.</i> —Young beds to be treated from the 2nd and 4th applications to the fruit bearing plants.	
RASPBERRIES AND BLACKBERRIES (Rust and Anthracnose.)	Cut the stems that are badly anthracnosed. Before buds open, sprinkle with sulphate copper solution.	When new stems appear, Bouillie-Bordelaise and Paris-green.	10 to 14 days later, a fresh dose. †	After gathering fruit, cut away old stems, thin new stems, and sprinkle with Bouillie-Bordelaise if needed.	<i>Remark.</i> —If red-rust appear, dig up and burn the whole plant.	
CURRENTS (Mildew, caterpillars.)	As soon as caterpillars appear on the lower leaves and inside the bush, Paris-green.	If they reappear, same treatment plus Bouillie-Bordelaise against mildew. †	If the caterpillars persist, Pyrethrum or Hellebore. †	After fruiting finished, Bouillie-Bordelaise.		
GOOSEBERRIES (Mildews, caterpillars.)	Bouillie-Bordelaise and Paris-green, as soon as the leaves appear.	Repeat the remedies 10 or 14 days after.	10 or 14 days after sulphur of potash on the English sorts. †	Same repeated 10 or 14 days after. †	If mildew persists, after fruiting over, Bouillie-Bordelaise.	
TURNIPS (Insects, lice, flies.)	On young plants, mixture of Paris-green and plaster; for lice, petroleum emulsion.	Repeat in 10 or 14 days.	Again, in 10 or 14 days, particularly the emulsion.	Against grub, round roots infusion of Heleboro. Pyrethrum and emulsion of petroleum on the leaves if needed.		
PEARS (Spotted leaves, scabs, grubs, caterpillars.)	As soon as buds show, solution of sulphate of iron or of copper.	Bouillie-Bordelaise just before the flowers open.*	Bouillie-Bordelaise and Paris-green the week after the flowers fall.	8 to 12 days later, the same.	10 to 16 days later, Bouillie-Bordelaise.	Again Bouillie-Bordelaise, if needed, 10 to 16 days later.
POTATOES (Rust, scald, scab, disease, beetle)	Against scab, &c., steep seed in solution of 2 oz corrosive sublimate & 16 gals. water for 90 minutes.	Prevent the disease by 1 or 2 applications of Bouillie-Bordelaise and Paris-green when the beetles or their larvae appear.	Repeat as often as needed.	When rust in leaves, accompanies rot in tubers, Bouillie-Bordelaise.	Again in 10 days if needed.	
APPLES (Scab or black marks, blossom-grubs.)	Sulphate of copper solution sprinkled on trees before the buds show.	When the buds show, but before they burst, Bouillie-Bordelaise.*	After the flowers fall, in the same week, Bouillie-Bordelaise, and Paris-green.	The same 10 or 14 days later.	The same 10 or 14 days later.	10 or 14 days later, Bouillie-Bordelaise. †
PLUMS (Fungoid diseases, Curculio or weevils.)	Bouillie-Bordelaise and Paris-green when buds expand.	In the week the flowers fall, same treatment.	10 or 12 days later repeat treatment.*	10 or 12 days later, Bouillie-Bordelaise.	10 to 20 days later, use l'eau céleste, or the ammoniacal carbonate of copper solution.	10 to 20 days later repeat the treatment if needed. †
TOMATOES (Scald, rust, rot.)	Bouillie-Bordelaise for rust or rot.	Repeat if needed.	Repeat if needed.	Repeat if needed.		
THE VINE (Fungoid-diseases.)	Before buds open, sprinkle with sulphate of iron or of copper solution.	When the first leaves are half grown, Bouillie-Bordelaise and Paris-green.	When the fruit is set, repeat treatment.*	Same treatment 10 or 14 days later.	10 or 14 days later, if the disease still exists, Bouillie-Bordelaise.	Eau céleste, ammoniacal solution of carbonate of copper. †

ANIMALS.—Applications to be made as often as needed.

CATTLE—(Horn fly)—1. Coat the horns, near the head, with grease or vaseline mixed with a little sulphur, or with a few drops of oil of tar or of carbolic acid. 2. Sprinkle the whole body of the animal with emulsion of petroleum, by means of the pulveriser. 3. Prevent the increase of the larvae by knocking-about the cow dung in the pastures, &c., to hasten its drying up.

SHEEP AND HOGS—(Lice, fleas and other parasites).—Emulsion of petroleum with the pulveriser.

DOGS AND FOWLS—(Lice fleas, and other parasites).—Blow pyrethrum powder into the nooks and crannies of the hen house with the insect-bellows. (From the French.)

Household-Matters.

VENTILATION.—Have you not often noticed on entering a house the very disagreeable odour of cooking either going on, or the faint smell all over the house of what has been cooked.

Our friends will often say on coming in, what are you cooking that smells so good; and the chances are it is some kind of confection, for, when that is going on, spices, sugar, and nice flavouring of some sort form a part of it, and these combined mixtures always give off a nice smell.

On the contrary, who ever heard a word of praise for the cabbage cooking, or boiled pudding? In my house, I always have a few cloves thrown into the pot where the pudding is boiling, and the odour soon flies off and does no harm to the pudding.

Mutton, when first put into the oven for cooking, makes a horrid smell and this is often caused by not taking off the skin previously. Many people think this unnecessary trouble, but if they would do it there would be less grumbling about mutton. An onion in the corner of the pan will help in this case. In making soup, where bones are used, especially turkey bones, put in plenty of flavouring at starting, such as onions, parsley, herbs, not too much; this, with 2 or 3 cloves, will give off a very pleasant smell.

I have often heard people say, in the country, Oh! that horrid pork; can't you smell it?

Anybody who has ever gone into a fisherman's cottage will know, and wonder, how people can live and thrive in an atmosphere of stale everything. It is a rare thing to see windows that will, or are open; a friend of mine once said "it met me at the door and nearly knocked me over, I did my business and fled."

A little coffee burnt on the stove, or put on hot coals, and carried through the house will prove a most agreeable deoderiser.

Bad and good smells always ascend, but will soon fly off through open windows. The few simple remedies, I have spoken of combined with plenty of fresh air will soon rid the house of stale dinners.

BORAX IN THE HOUSE.—In the spring, bacon and hams rubbed with borax will not be attacked by the fly.

Sprinkle a little over fresh meat; it will help to preserve it for several days.

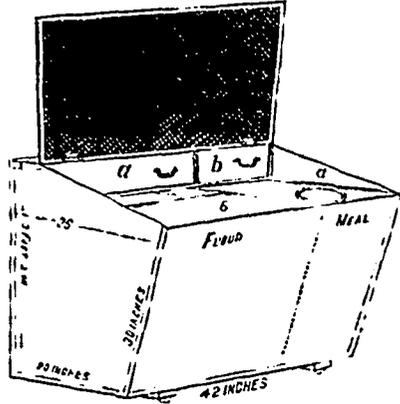
Treat fish, or poultry in the same way, being careful to put a little of it inside the poultry as well as out. It can be used with safety, being harmless.

CUTTINGS.

CHRONIC MEDICINE-TAKERS. So skilful were your grandmothers in compounding medicines of roots and herbs that minor ills were successfully treated and the calling of a physician was a rare occurrence. But there was no doubt a still greater factor,—the use of hearty, well-cooked food instead of the delicacies and pastry now so commonly used. Careful nursing also in pioneer days had perhaps as much to do with successful cures as the medicine itself, but now all is changed; millions of circulars are distributed announcing the wonderful cures performed with this or that patent medicine, and the symptoms of the commonest ailments are described in such a manner as to make even a well person imagine

he is seriously affected. The result is another victim added to the list of chronic medicine takers. You perhaps are feeling a little out of sorts, take a dose of the cure-all and in a few hours or a day feel like yourself again. The medicine gets the praise, when if you had, nine times in ten, taken a cup of hot water or given the system a needed rest, or used some simple home remedy, the result would have been equally gratifying.—L. D. Snook.

A USEFUL KITCHEN CABINET.—The illustration pretty nearly tells its own story, the dimensions being clearly given, so that anyone handy with tools can make the cabinet from this drawing without difficulty. At a and b are seen drawers, fitted with handles, for such



uses as the housekeeper may prefer. The generous compartment for flour is marked c and that for meal d. In the rear of the flour are two smaller compartments available for any purpose. W. A. Sharp.

CALIFORNIA SUN-DRIED FRUITS have become a staple product in the Eastern states, but there is much more room for fruit of this kind, as such fruit reaches only, about 5,000,000 of the population.

Apple Sauce: Cook apples until very tender, stir until there are no lumps, add sugar and a little gelatine, dissolved in warm water, 1 tablespoonful in a pint of sauce, pour the sauce into tencups part full. When cold this will be stiff like jelly and will present a very tempting appearance.

TO BLEACH MUSLIN.—Put the muslin in to a boiler of water and boil one hour. Put chloride of lime in to a sack and sew it up, about 10c worth of lime for 20 yards of muslin. Put the sack into a tub two-thirds full of water and stir with a stick till the lime strains through into the water. Then put the muslin in and stir around till the muslin is bleached white. Wring out and hang up to dry.—Mary E. McKee.

LABOUR SAVING TRUNK.—A new trunk which has just come into usage is 100 per cent more convenient than the old tray-lifting contrivance. This new arrangement is constructed like a dresser with half a dozen trays like so many drawers, which will push in and pull out easily, causing packing and unpacking a thing which one no longer dreads.

It is a hard job to find anything that will keep straight hair in curl these muggy days. Some women use a decoction of sugar and water, which leaves the hair with a confectionery sort of appearance about it, but a better curling fluid is made by adding three ounces of gum arabic to a half pint of rose water.

Rub grass stains with molasses, let it soak in awhile, then the garment when washed will be stainless.

Old-fashioned bareges and alpacas are finding favor in the present season, and they ought to be made up in the same style our grandmothers wore them.

PERFUMES ARE HEALTHFUL.—The art of perfuming in all its refinement comes to us from the Italians, and it has remained for an Italian to discover also that perfumes are actually healthy. He confines his theorizing largely to the domain of the vegetable kingdom, including the old-fashioned sweet-smelling herbs that the grandmothers loved to have about them. Among these are cherni, laurel, cloves, lavender, mint, juniper, lemons, fennel and bergamot. These exercise a healthy influence upon humanity by converting the oxygen into ozone. In the perfumes just mentioned there is a large quantity of ozone. Among those of old in this manner, but in a less degree, are anise, nutmeg and thyme. Among flowers that are medicinally qualified are the hyacinth, mignonette, heliotrope and lily of the valley, all of which have ozone in closed vessels.

Flowers without perfume are destitute of those health-giving qualities, on the contrary, absorb the ozone to the detriment of health. Flowers should be cultivated in marshy districts and all places infested with animal odors, on account of the powerful oxidizing influences of their ozone. The inhabitants of unhealthy regions should surround their homes with growing, sweet bearing flowers, and the more odoriferous the better.—Mary Porter Langly.

H. and Home.

HIGH HEELS are not in vogue, say the shoe dealers. The toes were never more pointed than now, but heels are getting broad and low, with the exception of the Louis Quinze, that still holds its own for certain occasions.

HOUSEHOLD HINTS.—Mustard plasters mixed with sweet oil will not blister.

Peppermints eaten after dinner promote digestion. So does popcorn.

In hand sewing, if the work is stiff and hard, rubbing soap on one's needle and fingers will be found very helpful.

An easy way for an overworked housewife to keep a stove well blacked is to black it thoroughly once a week. Then rub it each morning with a cloth, first placing over the hand one of the small paper sacks that grocers use.

Housekeeper.

FARMERS' CLUB OF ST. HILAIRE, ROUVILLE COUNTY.

Fruit tree culture—Trees planted too thickly—Cleaning, pruning and grafting—Bordeaux mixture—Grafting of unfruitful trees.

April, 27 1893

To the Deputy Commissioner of Agriculture, Quebec,

SIR

In accordance with your instructions I visited this place to-day in order to give a lecture to the members of the Farmers' club, and gave a demonstration of fruit tree-culture in the orchard of Mr. Pierre Germain, which was at-

cluded by a considerable number of fruit growers. Mr. O. E. Dalahie accompanied me and rendered valuable assistance.

There is a great extent of apple orchards on the South-West slope of the Beloeil Mountain, chiefly Fameuse. Unfortunately, they were planted too thickly, and have grown so that there is no circulation of air, and for want of this and of light, the fruit is not so fine as when the trees were young. Neither have the trees been well attended to as regards, cleaning, pruning and under culture;—consequently, numerous insects and fungi have attacked them and nearly ruined the crops.

I took occasion to point out these facts and to suggest the proper remedy, i. e. rather severe pruning, which I explained and illustrated, and in which all present took great interest.

Mr. Germain was just commencing spraying his orchards with Bordeaux mixture, using the strong formula (6 lbs of sulphate of copper to 50 gallons of water with the usual quantity of lime) for the first dressing before the leaves appear, and a weaker one (4 lbs of sulphate) for the spraying to be done after the blossoms have fallen and while the young fruit is forming. He stated that he had done this with the most satisfactory result, and succeeded in obtaining perfectly fair and well formed fruit of large size and excellent quality. I commended his example to all present and many expressed their determination to follow it at once.

If they will do so and take due care of the trees in other respects, as we had the pleasure of suggesting, the district of St. Hilaire will be again celebrated for the choicest Fameuse and other apples.

I also suggested to them the advantage to be gained by top-grafting unfruitful trees or poor varieties, describing, both theoretically and practically, the different methods of grafting &c., in which they were greatly interested, the majority not understanding the various systems before.

When we left, we were most cordially thanked for our suggestions and illustrations, one gentleman remarking that, although anxious to improve their orchards, they had been working in the dark. But, said he, we shall now be able to get to work with greater confidence.

Respectfully submitted,
by your obedient servant
GEO. MOORE.

STATE OF THE CROPS.

Grain-crops—Fruits—Drainage—Pipes vs. stones, &c.—Pastures.

It is rather soon yet to speak much about the crops. In our parish seeding has just finished, that is, grain seeding, except perhaps buckwheat, which will do for 6 or 7 weeks yet. The early sown grain is looking well; the later sown was coming up rather unevenly on account of the severe drought. A little shower on Sunday the 10th gave a different aspect to everything. Grass is looking remarkably well for the season, and vegetation, since the fine shower, has been very rapid.

In many sections, I have no doubt the farmers will not be able to do all their seeding. Below Quebec, on the South shore they hardly ever do any fall ploughing; leave it all until spring; and then the land becomes so dry they cannot plough. Fruits—Currants and gooseberries, have made

a fine blossom, and if frost does not come there will probably a good crop of fruit; but they require to be looked after if you wish to have much fruit. Apples and plums have an extra fine appearance at present. It was the 14th day of May last year that the severe frost came and did such an incalculable amount of damage from Gaspé Basin to the Western portions of Ontario, it is to be hoped that we shall not have it repeated this year.

DRAINAGE

In passing by a store on McGill st. in the City of Montreal the other day I saw drain-tiles advertised. I went in to know the price, as I have an idea to put in a tile drain this year. The price was much lower than I expected \$14.00 per 1000; now 1000 will very nearly make a drain for 5 acres: this is for 2-in. tile. Many a drain have I laid with stone, and some with wood—take the stone for instance and if we would count the time in digging, hauling and laying the stone, at a fair rate for labour, it would cost more than tile. Some of those stone drains have been laid 40 years and over, and some of them are still working well, but not more than a tenth of what were laid are now working. I doubt if the wooden ones will be as serviceable; take what is called a dry drain; that is, one that does not run water the whole year; the lumber soon rots; one that runs water continuously, or nearly so, will last much longer. It makes no difference with tile drains; wet or dry, it is all the same to them. I feel sure it would pay most people to borrow the money. If they have not got it, to buy tile: they will the sooner lift the mortgage, should there happen to be one. Well drained land seems to stand the drought better, too; although at first thought many will hardly credit this statement but it is a fact, nevertheless. (1)

Pastures are looking remarkably well for the season, a good many people are afraid of patronizing the cheese factories this spring. Cheese is all right; never fear. Butter is now down to rock bottom, down to a basis where it can be exported.

Yours truly
PETER MacFARLANE.

Chateauguay, 11th April, 1896.

WEEDING AND HORSE-HOEING.

Danger of putting off—Hoeing equal to manure—Breed's weeder—Thinning roots.

A stitch in time saves nine, applies in an especial sense to the farm at this season of the year. The time to kill weeds is as soon as they come to life, and we should never neglect the opportunity of doing so in favourable weather. It is not unusual for a farmer who is not on the alert to say: To-morrow, I must run the horse-hoe through my root crop, when he might just as well have done it, to-day, which has been fine for the purpose, and, alas, the next day rain comes and continues for some time, and the weeds which might have been killed grow faster than the crop because of the neglect of a single day. Promptness always leads to success and the reverse to disaster and loss. And no less important is it that the cultivator is kept going for the purpose of aerating the soil. It used to be an old maxim that a hoeing is as good as a manuring and it is remarka-

(1) The roots can get down deeper.

ble to notice the effect upon a hoed crop: it grows as if by magic. Lose no time now, your crops depends upon your diligence and not only that but your land for the future. An excellent implement is "Breed's universal Weeder" It can be taken cross-wise of a corner potato crop, just as it is coming up, and will kill the weeds in their embryo state without disturbing the roots of the plants. I have seen it worked with great advantage.

Another important matter to be attended to now is the proper thinning of the root crop.

The late Dr Lindley, being asked to define a weed, said it was any plant which occupied the space where another plant should grow, so that we must look upon all plants which grow too close to their neighbours as weeds, and remove them as promptly as possible. And this, too, must be done at the right time, otherwise, they will become drawn up and weakly and the plants which are left will take a long time to recover their vigour if ever they do so. Very few farm operations require more tact and judgment than "thinning".

Remember that "Ill weeds grow apace" and we must try to keep them in subjection as our natural enemies, while at the same time we shall admit our friend the atmosphere or at least that part of it which is most necessary for vegetation.

GEO. MOORE.

SIR.—In answer to your enquiry as to the Cedar Hedge. I beg to say that when it has been neglected and allowed to grow thin at the bottom it is impossible to make it thicker. Pruning will then do no good because the cedar will not branch out of the old wood; the only way is to plant a new hedge with cedars from one to two feet high and keep them sheared annually to keep it in shape.

GEO. MOORE.

Precisely the reply we sent to the enquirer.—Ed.

PRACTICAL AGRICULTURE.

BY JAMES DICKSON.

Misprints—Turnips—Thinning or singling.

WEED EXTERMINATOR

Sometimes errors occur in punctuation and otherwise, readers were probably puzzled to read in my last of "weed-seeds." Please read "weed-seeds."

TURNIPS

(Continued from May No.)

By the time this No. reaches the subscribers, some of those who followed me in the effort to describe my method of raising turnips, will have their plants through the ground. How pretty those green lines are. You look at them every morning. You cast your eye over them every time you pass, they are a thing of pleasure all summer long, and no matter how weary you are, the sight of them lightens your countenance and step. And you say "How these turnips do grow."

On close inspection in the early morning, you can see the weeds coming through. You cannot think of hand hoeing all that piece. You are in a quandary what kind of an implement to buy. You have not the cash, but you can give your note. Don't! All you require is something that will stir the soil two or three inches deep. If you have a pair of old plough handles, a piece of spruce

scantling, and a handful of six inch spikes, you can make a better turnip cultivator in an hour than you can buy with a two dollar note. To save you the trouble of experimenting, I will give you dimensions &c. Cut the pieces of scantling 2 feet 6 inches long, in case you split them, and have to do the work over again, drive the teeth (the spikes) in now. If you use bore hard wood, Lore, or dip the points of the spikes in oil, and drive by sharp light blows. Do not drive them in a line in the centre but at alternate sides off the centre. Break off the points so to leave about three inches below the wood. Bevel the fronts ends so that the teeth at the hind end will be 13 to 15 inches apart, (according to the width of your drills) Nail them together. Nail well a wide board across the hind end. Now bolt the front ends together. Bore a hole for a clevis, in the left side piece about a foot from the front end, so that it will not draw straight behind the horse. (You will observe that as the horse walks in the score, and your cultivator is to work at one side, in the drill, consequently it must draw to one side) the draw chain must not be too short, or it will carry it off the ground. With the handles in, you have now an implement that will be a pleasure to use, and will never bring you into debt, but remember it is not a stone puller.

We will now suppose that you are ready to work, that the day and the ground are dry, that your cultivator draws to the right hand side, and that it is new work for both man and horse. In that case you require a boy, the work is very light, and a small boy can ride. Now, keep your eye on the right hand line of turnips, and, bear as close as possible without disturbing them, and it won't hurt them, if sometimes you do, there will be enough left. At the end lift the harrow and carry it round while the horse takes the next score, at the end you have one drill done, and in less time than ten men could have done it. You will see that I propose doing only one side of one drill at a time. The implement is not yet made, can do one both sides of a drill as well as you can do one side. (1) and with a very little practice you will be able to do all the work except two to three inches on the crown of the drill, if your plants are not thoroughly in line.

Your neighbour with a barn full of costly implements may smile at your efforts as a root grower, you also will smile when the work is done, and if you are keeping an account of the cost, your smile will at this time be a very broad one. And one item you will remember that the seeding cost a mere trifle.

You have now arrived at what to the novice is a tedious part of the culture of turnips: the thinning. Here I may say, that I never had a man who was reared in Canada who could do this part of the work in a proper manner. A farmer's boy reared on a Scotch farm makes short work of it, and the best hand I ever had was an Irishman. If you have not a first class hoe with a square edge and corners, get a new one, grind it sharp as a knife and keep it so with a coarse whetstone, and with light artful strokes shave the top of the drill, and with "push and pull" clean the plant line thoroughly leaving one good plant every ten to twelve inches. When two good plants are six or eight inches apart, and poor ones on each side, spare those, and leave longer spa-

(1) Pardon, Sir; There are several that work perfectly but they have the side-hoes in proper shape.—Ed.

ces from the next ones, the plants will accommodate themselves to the circumstances, this is a difficult part of the work to describe, but it is an art easily learned by an intelligent head. A good hand will soon be able to complete the work with scarcely ever putting a hand down, if the work is done before the plants are too large. The drills will require to be gone over again, but if the land and manure were properly handled in the first place, the work is now done until harvesting.

WEED EXTERMINATOR

There is nothing which makes the summer weeding easier, and keeps it so completely under control as a proper implement to accomplish that purpose. The time was, when the hand hoe was considered that implement, and the hoed crops were generally ready for the hoe before the spring seeding was finished, with the result, that a part of the work was generally done at a great disadvantage, on account of the advanced growth of the weeds.

There is no handler implement on my farm than my Horse Hay Rake. It is an excellent weed exterminator, a manure breaker and spreader. And on top dressing, all straw, and long rubbish, can be raked to the ends of the field and drawn off. And at the same time the manure is more evenly distributed and broken up than by any other implement I ever used.

It is just the thing to cover grass seeds, and fine the surface of newly seeded land. Also to pull potato tops, and rake them into rows. And it is an excellent implement in the earlier stages of corn and potatoe culture. Do not be too late in using it; begin before you can see the weeds. Go over the ground lengthways, and in a couple of days crossways, and continue as necessary until the plants are three to four inches high. Work in the fore part of fine dry days. It is necessary to have it double to be of good service. I have the head of an old rake fastened underneath with wire, so that practically there are two teeth in place of one. By a proper handling of the brake and lever it can be made to go lighter or deeper as required. If the land is heavy, and there have been heavy rains, it may be necessary to use the harrow first.

Correspondence.

Moore's Station, P. Q. April, 17th 1896.

Arthur R. Jenner Fust,
Editor of the "Journal of Agriculture"
Montreal.

DEAR SIR,

If it will not be asking too much of you I shall be very much obliged, if you will answer the following questions:

1. What kind of crops or crop do you think would be the best for me to sow on heavy clay soil (a) stubble that is to be plowed this spring?

(b) on the same kind of soil but green sward which was plowed last fall; the crops to be used?

P. S. I want to get two crops if possible off part of the land, will the stubble be the better for the two crops?

P. H. M.
As green feed, to be fed to milking cows at night in the stable (this summer.)

2. Should the manure be plowed in lightly, or put on the land after it is plowed, and harrowed in?

I am not a subscriber, but mean to

be, after next July as I see that is the number which begins the year.

Hoping that I am not asking too much of your time and troubling too much.

I remain your truly,
Philip H. Moore,
Moore's Station.

P. Q.

"Answer:" 1. By far the best "green-meal" for cows, giving milk, is a mixture of oats, pease, and tares. The quantity of seed for an "acre" is:

- 1 bushel of tares (vetches)
- 1 do pease,
- 2 do oats

To be put in with "a drill", or at any rate buried pretty deep. The land to be "well" harrowed before the drill, and a couple of times given after the seed is in; a roller finishes the job, and makes mowing easy. Rolling is too generally neglected here.

2. The manure should be turned in somehow or other, as, unless it is very short, it will trouble the man who cuts the crop if it is allowed to lie on the surface of the land.

Do not begin to use this until the pease are in blossom. Of course you know that all "green-meal" should be allowed to lie and "wilt" for 5 or 6 hours after it is cut, before being given to the cows.

The whole of the land intended for green-meal—both stubble and sward should be divided into 3 parts. The first sown as possible, the second ten days afterwards, and the third part 15 days after the second. Thus:

- 1. May 1st
- 2. do 11th
- 3. do 26th

Unless the longer interval is allowed to elapse between 2 and 3, the growth will be so rapid that both parts will come together.

Any waste that the cows make will be welcome to the pigs.

As soon as a day's ploughing of the crop is off, plough the land and sow "rape", at the rate of 6 lbs an acre, after harrowing fine. Your "sheep"—Southdowns, if we remember—will be very glad of it. On heavy land, like yours, no manure will be needed. For cows, it would be better to try a mixture of 3 lbs of rape and 10 lbs of Hungarian-grass to the acre, as this would give a better cut and be less likely to bloat the cows. You will of course make your first sowing on the fall-ploughed land, as the other will take time and labour to get into shape.—Ed.

Sherbrooke, 25th April 1896.

Arthur R. Jenner Fust, Esq.
Editor of the "Journal of Agriculture."

DEAR SIR,

I see in the journal that the "Bordeaux Mixture" is highly recommended for spraying apple trees, but I have failed to find out what it is composed of.

Could you inform me; and of the quantity that should be used for each tree, and when would be the most proper time to apply it? I have a few trees in my garden, but the greater portion of the fruit is destroyed by insects; some few years ago I sprayed them with Paris green just when the blossom was falling, the foliage of some of the trees was injured, but I had a good return in fruit for the trouble I took.

Any information you can give me, will be highly appreciated.

I am dear sir,
Your servant,
Wm. GRIFFITH.

"Answer:" The receipt for making Bouillie-bordelaise runs as follows:

- Blue vitriol..... 4 to 6 lbs
- Quick-lime..... 4 lbs
- Water..... 40 gallons

First, dissolve the vitriol in a gallon of hot water, and slake the lime in enough water to make a clear solution, which strain. When both solutions are cool, pour them slowly together into a "wooden" tub, stirring constantly, and add gradually, still stirring 40 gallons of water. For further information on insecticides, &c., see p. 365 of this number.

FARMERS' SYNDICATE
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Sheep: Shropshire, Lincoln, Oxford, Cotswold, South-down, &c., &c.

Fertilizers and agricultural implements of every kind. Send in your order at once for feed-cutters. Farm products of all kind sold for our members. Informations of all kind given to members.

LONDON MARKETS.

Mark Lane: Prices current; May 11th

Wheat, per 504 lbs.; British.	s. s
White	27 30
Red	26 29
London flour per 280 lbs.....	25 --
Barley, foreign	13 44
Malting English	30 38
Grinding	18 22
Oats, English per 8 bushels.....	15 29
White pease	32 46

FOREIGN

Wheat—Manitoba	27 29
Canadian white pease.....	27 --

Milk-cows, per head., £23.

BEASTS.

Scotch	4 6
Herefords per stone of 8 lbs.....	4 4
Welsh (rants) per stone of 8 lbs..	4 2
Shorthorns (rants) per tons of 8 lbs	4 2
Fat cows	3 8

SHEEP.

(Shorn.)

Small Downs per stone of 8 lbs...	5 2
Half-breds and Scotch per stone of 8 lbs	5 0
Lambs per stone of 8 lbs.....	8 0
Calves per stone of 8 lbs.....	5 4
Pigs per stone of 8 lbs.....	3 6

BUTTER.

Fresh, (Finest factory) per doz. lbs	11 12
English Dairy-butter fresh.....	10 11
Irish (creamery).....	90
Danish	92

BACON.

Irish	56 61
Canadian	40 46
Hams, Danish	54

American	48
Irish, small	54
Hay, per load of 2016 lbs.....	
Prime meadow	54
Prime clover	90
Straw, per load 1296 lbs.....	32
Best	40
Hops from 20s. to 70 per 112 lbs.	

The Dairy.

FODDER CHEESE.

In the year 1895, the make of fodder-cheese was in the neighborhood of 56,000 for the Dominion of Canada and the stocks of 1894 on hand were something over that figure, making in all over 100,000 boxes of very undesirable goods in the market, more than sufficient to clog the wheels for the whole season. It has been recommended by the Board of Trade of Montreal for factorymen to make as few fodder-cheese as possible this spring. Now, if this advice is followed strictly, I cannot see why cheese should not sell fairly well the coming year. The stocks of old goods are pretty well worked off, so that, by the opening of navigation, they should and will be in a very small compass. It is to be hoped for the good of the trade that the advice given, where at all practicable, will be followed, as the Canadian cheese trade has now grown to such proportions that it would be really a disaster to have it killed completely, or even crippled materially. There was no money in the business last year, either to the patrons who furnished the milk, or to the speculators, who thought very fine No 1 goods, at less than 8 cts per lb., was good property. I have just seen a lot of over 500 boxes of really good, well made cheese, to day, that has changed hands at about 7¼ cents per lb: it must have cost at least 8 cts per lb. last year, the shrinkage of about 3 lbs per box, cold storage charges, interest on investment, freight and insurance, that certainly must mean well on to \$1.00 per box loss and perhaps a fraction more. Had there been only a few fodder-cheese made, with only a few thousand boxes of old cheese left, the market to my mind would have been in a good healthy condition during last year. Let the cheesemakers take warning and put off the opening as long as possible by every reasonable excuse, for every maker knows there is not any money the first week or two, but often a fair loss, that takes often a month or so of the paying season to make up. Should they delay opening, they will have sufficient milk to pay expenses from the start. There were over 1,300 (thirteen hundred) factories in this Province in operation last year; let each one open, say, two weeks each, later than usual, and my opinion is the market will take care of the balance,—perhaps not at war prices but at a fair price; so that the patron may have sufficient to pay him for feeding his cattle, and a little to make the pot boil. I hope these,

few lines may be of service in putting the cheese trade on a solid paying basis. The cheese trade in the past 25 years has had its periodical bad spells; but it has always recovered and it is to be hoped it will do so again. It has often been remarked that it is usually the unexpected that happens in the cheese trade. From present indications, should my advice be taken, the cheese trade should be in its normal groove before many moons have waned.

Chateauguay, 9 April, 1896.

PETER MACFARLANE.

REVOLT AGAINST THE BUTTER TUB.

The "Canadian Gazette" has an interesting article under the above heading. "One noteworthy feature of the Canadian butter trade with the United Kingdom," it says, "is the success of the revolt against the old-fashioned tub. Merchants, one after the other, in England and Scotland, have objected to the tub, with its waste and uncomely look, and have welcomed the 56 lb. boxes in which the creamery butter is now coming to hand. The butter from Australia and New Zealand comes in 56 square boxes, and it would be well if all Canadian producers followed suit." "We are convinced," writes one large West of England firm, "that Canadian butter all round would realize from one to two cents per pound more if packed in boxes; and we say this as the largest importers of Canadian butter in Great Britain, and after extensive inquiries during the past two years." "The sooner the old tubs are finally abolished the better," says a Glasgow merchant; "during the scarcity, choice Canadian creamery in boxes fetched as high as 1-10 shillings per 112 lbs."

This revolt against the tub is typical of the general revolt against inferior butter. The Canadian butter is distinctly improving, but it is still behind Danish, Australian, or the best French butter. Note, for instance, this report from Bristol: The principal faults are either the butter is too salt, or there is too much moisture left in, and the butter has not been shipped soon enough, and consequently gets stale. Canadian butter makers must find means to get rid of the large amount of whey that still remains in the butter. This, of course goes sour, and the flavour of the butter is thereby spoiled. Then it ought not to be difficult to use only sufficient salt, and that of the right grade, to ensure it keeping a reasonable time." "Make the butter milder," says a London house; "that is, less salted, and it will suit the London market admirably." Others speak of the desirability of more refrigerator facilities here and on the other side of the Atlantic.

The position which Canada takes in British butter markets is capable of great improvement, as these figures show:—

	1893	1894	1895
Imported from Denmark.....	\$5,278,875	\$5,813,954	\$5,948,463
France.....	2,679,150	2,351,267	2,444,734
Sweden.....	1,452,099	1,513,779	1,644,111
Australasia.....	870,674	1,429,977	1,424,585
Germany.....	830,706	702,960	565,093
Holland.....	763,897	831,951	939,326
United States.....	104,220	125,947	271,776
Canada.....	194,924	90,121	153,401
Other countries.....	579,678	666,143	853,741
Totals.....	\$12,752,593	\$13,456,899	\$14,245,230

Note that Canada is now at the bottom of the list of specified countries, whereas, in 1893 she stood above the United States. Note also the giant strides that Australasia has taken in the last two years.—"Montreal paper."

A GOOD COW.

"For the benefit of the dairy interest we will give a description of what an authority thinks would be a good cow for profit. "I first look," he says, "at a cow from the front and see that she widens as she gets back to her hips, or is wedged shape. Next I look at her side and I see that she rises on her back and descends on her belly as she goes back to the tail, or in other words, that she is wedge-shaped from this point of view. These two looks at her enable me to see that she has a feminine appearance, that her head is small and neat in proportion to her body, with a waxy, small horn, a mild but large eye, broad muzzle, and that it is well set on her neck; that she has a good chest and large, deep paunch and large, full ribs, fuller below and joined to a rather high backbone, but must not have the breadth of back we look for in a beef animal. If the chine is double it indicates a cow above the average. The udder must run forward as level as possible to the belly and well up behind, with four good sized, well shaped teats, standing well apart. Now I examine her escutcheon. If I find her skin is thin, soft and greasy, with fine soft hair, of rather a furry nature, and showing the skin yellow under it, that her udder has soft thin skin, with very soft, furry hair, that her milk veins are large, long and crooked, running to extension or chest veins entering the body with two good sized holes, and if the veins extend over perineum, I then look for a large, well-shaped, first-class Flanders escutcheon and an oval on each side of the back of the udder and perhaps two thigh ovals, and to finish and find all parts corroborating, we will look on the vertical escutcheon for some spots of oily, lemon colored dandruff, and at the end of her neat, lightly made tail to find some larger pieces of yellow dandruff. I do not like to see it colored brown, and as I step back from her I give a parting look to see that her hips are rather large and long, somewhat sloping, and that her large udder has room to project between her legs. I never saw a hard, thick-skinned cow, with coarse, long hair on her udder, that was a good butter maker, or fit for anything but giving poor milk, if a strong milker."

Hoard's.

PREPARED STOCK FOODS.

ED. HOARD'S DAIRYMAN:—Can you give me any information about "B"—Stock Food? A representative of the manufacturers is introducing it in this vicinity. He claims it has been on the market nine years, and is used extensively in the West. I have not been furnished the printed formula, but the agent enumerated a dozen or more ingredients of which it is composed. It is directed to feed a tablespoonful twice a day to cows, and it is claimed the flow of milk and secretion of butter fat will be increased thereby as much as 30 p. c. The agent said it was an aid to digestion and by the judicious use of it, the food was more thoroughly assimilated. The price is 5½ cents per

pound. I noticed he had many orders from dairymen, but being somewhat sceptical myself, determined to withhold my order until having ascertained whether the preparation was meritorious or not. I have never seen it advertised, nor have I noticed that you include it in your balanced rations, but being a new subscriber, I do not claim to be very well posted.

If the Editor, or any reader of the "Dairyman" has any knowledge of the above, I should greatly value their opinion before venturing to feed the food to my stock. I might add that he refused to sell less than a 50-lb. package, though I offered to try a small quantity of it. ARTHUR T. HENSON.

Duchess Co., N. Y.

We have taken the liberty to omit the specific name of the food mentioned. We know nothing about it, and never heard of it before. It does not follow that it may not be a good food, and in its use justify all the claims made for it. There are lots of good things that we never heard of, but we do not buy them on sight or on the representation of agents. We have at the earnest solicitation of agents, tried two different kinds of these stock foods, but could not discover any benefits from their use. The Maine Experiment Station has analyzed several of these feeds, and found them to consist almost wholly of oil meal, with aromatic herbs and seeds added to disguise the real nature of the compound. (1) It is beyond question that the use of some of the "condimental foods" and following the advice and directions given for their use, has resulted favorably, but it is believed that the improvement resulted largely, if not entirely, from the better feeding or other food and care. (2) An animal, when in good health and properly fed and cared for, does not need medicine, and it is immaterial whether this animal is a man or a cow "food" or something else. The price at which this compound is sold, forbids its being considered a food, and the claim that the flow of milk and secretion of fat can, in any way, be increased 30 p. c., if the cows were previously healthy and well, is untenable. (Very true.—Ed.)

A CANADIAN BUTTER AND CHEESE MAKERS' CONVENTION.

ED. HOARD'S DAIRYMAN:—The Cheese and Butter Makers' Convention held at the Dairy School, Guelph, was a grand success. The makers turned out in large numbers, filling the lecture room, where the meeting was held, to its utmost capacity. The convention was held under the auspices of the Provincial Dairy School, the Ontario Creameries' Association, and the Western Dairymen's Association, and its success is largely due to the efforts of the officers of these institutions.

Mr. A. F. MacLaren, President of the Western Dairymen's Association, presided at the afternoon session and Mr. D. Derbyshire, President of the Creameries' Association, at the evening session. These gentlemen, by their practical, definite knowledge on the subjects discussed, did much to make the meeting a success.

Dr. Mills, President of the Agricultural College, in a short address, emphasized the

(1) Worth attention.—Ed.
(2) Worth attention.—Ed.

IMPORTANCE OF CLEANLINESS

in every part of dairy work. From his own observation he had come to the conclusion that the average man is untidy, many of them dirty, and therefore, the average individual had to make an extra effort to keep himself clean and tidy. Cleanliness in an individual is largely shown by the condition of the finger nails and teeth. He urged makers to give attention to these things, and not to smoke or chew tobacco. Some of the best breeds of cattle for dairying were the grades, and he advised judicious culling so that the herd should always be choice in its individual members.

In a paper on

HANDLING OVER-RIPE MILK

for cheese making, Mr. T. B. Millar advised makers to educate their patrons on taking care of milk by strict attention to cleanliness, airing and cooling. When milk is taken in in an over-ripe condition it should not be stirred nor heated until there is sufficient milk to fill the vat; then heat very quickly. Such milk should be set at a temperature of from 82° to 84°. A rennet test should be made, and if the milk is found to be working too fast more rennet should be used—half an ounce extra to 1,000 pounds of milk. Commence cutting the curd early, cook quickly, and draw off part of the whey as soon as possible. Stir the curd well immediately after milling; air and mature well before salting. A profitable discussion on the subject followed Mr. Millar's address.

In discussing the

HANDLING OF TAINTED MILK

Mr. I. W. Steinhoff said that many patrons took it for granted that so long as the milk delivered at the factory was not sour it would be accepted. Making cheese from tainted milk was injuring the trade. The process of ripening tainted milk is hastened by covering the vat with a clean light cloth and keeping the milk at a temperature of from 86° to 90°, which will largely throw off the tainted flavor. In all cases of handling tainted milk a pure starter should be used. The curd should be kept at a temperature of 97°, after the whey is run off, and should be aired as much as possible. One of the series of difficulties the cheese maker had was, at all times, to detect milk that would cause a bad flavor in cheese. In the discussion which took place after, the feeding of turnips to milch cows was thoroughly condemned by all the speakers. (1)

SEPARATORS AND SEPARATING MILK

was the subject of an address by Mark Sprague. He emphasized the importance of the strictest care and attention in placing and in running separators and showed the advantage of having the cream separated in this way. A cleaner separation would be effected, and the cream being handled by one skilled person would produce a better quality of butter.

T. C. Rogers read a paper on the

PREPARATION OF CREAM FOR CHURNING

in which he dealt largely with the factors employed in the cooling, ripening

(1) Then they never use them properly
(2) Then they never use them properly

and preparation of cream for the churn. Where provision is not made for cooling the cream, it is sure to be ripened and churned at too high a temperature, and will give to the butter a soft, oily texture, that will decrease its value. Cream is ripened to improve the yield, flavor, and keeping quality of the butter. The butter maker should know how to control the lactic acid in the cream so as to secure a uniform ripeness, from day to day, at a temperature that will not injure the butter. A good temperature at which to ripen cream is about 60° in winter, a lower temperature being more suitable in summer, as the milk at the time of separation already contains more lactic acid.

Mr. F. C. Harrison, Professor of Bacteriology at the College, read a valuable and technical paper on "Cheese and Butter Starters."

At the

EVENING SESSION

the Chairman, Mr. Derbyshire, who had just returned from the Cedar Rapids convention, gave some reminiscences of his trip and how the butter industry of the western states was progressing. Mr. Geo. H. Barr gave an excellent address on "Practical Cheese Making," in which he dwelt upon the importance of the maker keeping himself, as well as his factory, clean and tidy. Unless he does this he will not be in a position to educate his patrons along the lines of cleanliness in caring for milk.

A paper on "Practical Butter Making" was read by J. B. Muir, and the discussion which followed turned largely upon the question of washing or not

WASHING BUTTER

The larger number of those who took part were in favor of a certain amount of washing, especially if the butter was to be kept for some time. Where the butter was going into consumption right away, some were in favor of not washing the butter, as a better flavor would be obtained. It is always considered safe, however, to give the butter a certain amount of washing.

After a number of short addresses by some of the prominent dairymen present, the convention closed, with everyone feeling that this first gathering in Canada of cheese and butter makers had been a decided success, and was well worth repeating another year.

The District Conventions, held by the Western Dairymen's Association this year, have been more successful than any previous ones. The attendance and interest were good and dairymen seemed to be keenly alive to the fact that their best efforts must be put forth to keep up and improve the quality of our cheese.

Among those who rendered valuable service at these gatherings were, Prof. Robertson, Prof. Dean, A. F. McLaren, President of the Association, John L. Pearce, R. Robertson, Robt. Cleland, F. J. Sleightholm, A. T. Bell, J. A. Gray, H. White and T. B. Millar.

A number of local meetings have also been held in connection with many of the factories, that will do much to bring about a greater improvement in the quality of the product.

Though there has not been much excitement and enthusiasm about winter dairying this year, that branch of the industry has perhaps given as good satisfaction and progressed as favorably as during any other season since the

movement was first inaugurated by the Dairy Commissioner. It has become an important part of co-operative dairying in this country, and the number of cheese factories putting in apparatus for butter making is gradually increasing. The low price of cheese has, doubtless, had some effect in turning the attention of dairymen to this important branch, but everything is judged from the merits and power to return value for the labor expended, and a profit upon its operations. The winter creamery seems to be doing this, and as our dairymen adapt themselves more and more to its requirements, the profits in the business will be more apparent.

The local markets have taken the bulk of this winter made butter at fairly remunerative prices, ranging from 20 to 22 cents. As the consumer in our towns and cities becomes more accustomed to creamery made winter butter, put upon his table fresh, the demand will increase, and this winter-butter will take the place of the summer-goods, held over for winter's use. There has been an increased demand for Canadian winter butter in the British market, which has tended to stimulate the industry considerably. The experimental shipments sent across last year have, doubtless, had something to do with this increased demand. A number of factories are sending winter butter direct to English dealers, and are receiving remunerative prices. If this demand continues, and there is no reason why it should not, if the quality is right and the butter sent across is in proper shape, we may look for a marked increase in our exports of winter butter another year.

Several of our large cheese factories are now contemplating putting in butter-making apparatus and making butter during April and the early part of May, instead of fodder-cheese, as has been done other seasons. It is, perhaps, a wise move, as the prospects for early made cheese are not very bright just now. A little caution, however, should be shown in this matter lest there be a surplus of butter made that will be difficult to get a market for at this season of the year. At present prices, butter will likely pay better than fodder-cheese, considering the present prospects, and if the equipment is on hand, we may expect those factories to make more or less butter next winter.

The cheese-market here, or better the British market for Canadian cheese, for there is no business being done on this side to speak of, is a very difficult one to understand. A few months ago it was estimated, on good authority, that by the time new goods were ready for the market there would be no old stocks on hand. With this in view, it was expected that as the season wore on there would be a decided advance in prices. But the very opposite has been the result. From 5 to 5½ is about all that fine September goods will command, and there are reports of a few sales of early summer goods at considerably lower figures. Holders, therefore, of last season's goods will lose considerably at these prices. There are a few factories in the west still holding their fall makes, for which they were offered 9 and 9½¢ before the end of the year. Some of these are now negotiating to consign these goods. As stated

in our last letter the cheap meats and other food products which the British consumer can get at lower values than ever before, are the chief factors in keeping prices down. If there is a shortage in the make at the beginning of the season and the stocks on hand are not much larger than have been estimated, dairymen may have some reason for looking forward to higher values later on in the season.

There is great scarcity of fodder in many old dairy sections, and as many farmers have had to sell their cows they will not be in a condition to give a large flow of milk when the season begins. This may ultimately have some effect on the prices.

I. W. WHEATON.

"Hoard."

London, Ont.

THE SEASON.

"It is now nearly the middle of April and practically none of the spring's work done and no spring rains to hand. This means hurrying times for farmers for the next thirty days and a probability that a large proportion of the work will not be done thoroughly, but this is almost the greatest mistake that can be made. Better by far to leave half of the ground untouched and go over the other thoroughly, than to half-work the whole. Never before was there more imperative necessity for thorough preparation of the soil for the seed. There is no more profit in poor crops than in poor cows. Ten acres well tilled will produce more than twenty acres half tilled, and at less cost and with more satisfaction. In ordinary seasons, it pays to do everything well, but in backward and unpropitious seasons, extra care in fitting the land in subsequent tillage is the only way to avoid serious loss."—Ex.

FARMER'S INSTITUTE AT MARGARETVILLE, DELAWARE COUNTY N. Y.

ED. HOARD'S DAIRYMAN:—The winter has furnished few worse days than March 19th, the day appointed for the Institute at this place. The morning opened with a blinding snow storm, which turned to rain, and nearly the entire day it came down furiously. Of course, the attendance was light, but there were more farmers out than were expected: some even drove several miles through the storm. The meeting was called to order at 11 a. m., by Mr. J. S. Woodward, one of the Institute workers, and after a few preliminary remarks, the address of welcome was given by Mr. J. K. P. Jackson, editor of the local paper. The entire address was well rendered, and heartily appreciated by those appointed to take leading parts in the deliberations of the meeting. Mr. Jackson said in part.

"Every thing comes from the soil, and all other occupations are dependent upon Agriculture. All other industries have their organizations for the betterment of their conditions, why should not the farmers do the same? 'Tis said the farmer works early and late; but who does not labor,

WHAT ACHIEVES SUCCESS?

The best thing the Almighty ever did for man was compelling him to labor. Men in other professions, who lead in them, toil as many hours as the farmer. Among the farming class 75 p. c. own their farms, while only 3 p. c. of those who engage in trade make a success. Because Jay Gould accumulated a fortune, all may not hope to. There are not many Jay Gould's."

The response was given by Mr. Henry Van Dresser, one of the Institute force.

Mr. Van Dresser said since last Sept., he had visited 13 different states, and everywhere Delaware County was spoken of as the banner dairy county. He had found that the farmers in dairy sections, read and think and act. Idleness breeds contempt. Boys born of rich parentage, may find easy pathways, but far too often we find them with weak minds.—"I was born in a stable, so to speak, and thus inherit a love for the cow; and early taught to till the soil from the shoulder. The boys of to-day are to become our future farmers, and we should interest them in farm work. We appreciate the hearty welcome extended."

Mr. J. S. Woodward followed with his address.

OUR FOSTER MOTHER, THE COW.

The cow is a bovine mother, and should be treated as such. She should be warmly housed, abundantly fed, and relieved from all unnecessary exertion of whatever kind. No other animal does as much for us as the cow. The nations that eat the most butter are the highest in point of intellectual strength and moral rectitude. No doubt the cow brought to Adam to name was a perfect cow for her time, but she was a crude affair compared with our best of to-day. Food and environment have wrought wonders. The Buffalo on the western plains, and the typical Jersey, are all descended from the first two pair given to Adam. The Highlands of Scotland furnish the thick skinned, heavy coated Galloways, (1) and food and environment have made them what they are. The sleek Jersey, on her native island, and the Holstein-Friesian, of Holland, are what they are from the same cause.

The best cow has not yet been born. Coming years will witness something beyond our time.

The cow demands of us an abundance of pure air and water, and generous feeding. Our cows are crowded into too small a space. I saw 14 cows in a stable 40 feet long, 12 feet wide and 6 feet high. Ventilators are not large enough, and few cow-stables have sufficient sunlight. Sunlight kills disease germs. Many of our best dairymen do not turn cows out from November till May. The cow needs very little exercise. It pays to keep her comfortable and the quantity of milk is a sure indicator of comfort. A good milk producer is always a nervous cow. Cows are never comfortable in rigid stanchions. Thousands of hides will be sold this winter and spring from cows starved to death.

DISCUSSION.

Mr. Woodward is a firm believer in keeping cows in the stable all the time

(1) Not at all. The Galloway is a Lowland cow; the Kyles is the West-
Highlander.

and having a supply of water constantly before them.

How close to the floor should the ventilating shaft come?

Within a foot or so, but would provide an opening near the top of the stable for use in warmer weather.

Best litter to use in stable?

O, anything clean, fine and dry.

What is the best feed for butter?

If there is no silage, good clover hay, with equal weights of corn meal, wheat bran and cotton seed meal, with roots.

How much crimson clover seed to the acre?

One peck.

Cause of thumps in pigs?

Sows fed on corn, pigs get too fat. Give sows wheat-bran and milk, and provide exercise for the pigs.

How shall we restore our burned out meadows?

Mr. Van Dresser said they had already plowed 60 acres, a large proportion of which would be put into peas and oats, and the balance to corn, for ensilage. Harrowing and sowing on seed, was recommended on rather moist meadows.

First in the afternoon, came an address by Mr. Van Dresser on "The Selection of the Dairy Cow." Your reporter was too intensely interested in every word of the address to take notes. Suffice it to say, it was by far the best address upon this subject the writer ever listened to. Mr. Van Dresser was born, as he says, "in the stable," and knows the cow. From a very wide experience he has become an expert judge, and his services are sought by agricultural societies and cattle owners, all over the country. He made very plain the truth that the ideal dairy cow had always the "dairy form." From large size portraits of model cows, he made clear to his audience, what a dairy cow looked like, besides giving an object lesson of various points that would help to fix what he said in the memory. I have heard no more instructive address given at any dairy meeting or institute.

Following this address, the writer gave some thoughts concerning "Present Urgent Needs in Dairying." A few minutes were occupied in endeavoring to show the farmers present the advantage of every one having a text book in the home in the form of a dairy paper. Attention was called to the fact that "Hoard's Dairyman" had promised, in the near future, to give a series of illustrations of noted dairy cows, and the help it would be to those who had been so fortunate as to listen to Mr. Van Dresser. The necessity of knowing more of the details of our business was shown; in short, the crying need of more knowledge.

The evening session opened with question box. The absorbing question, coming up in different forms, was to know the best means of supplying food for our stock at lowest cost.

What variety of corn is best for the silo?

The largest variety that will ripen in your locality.

Is sweet corn best for ensilage?

No, it develops too much acidity, but to feed green, cannot be excelled.

"Hoard's."

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