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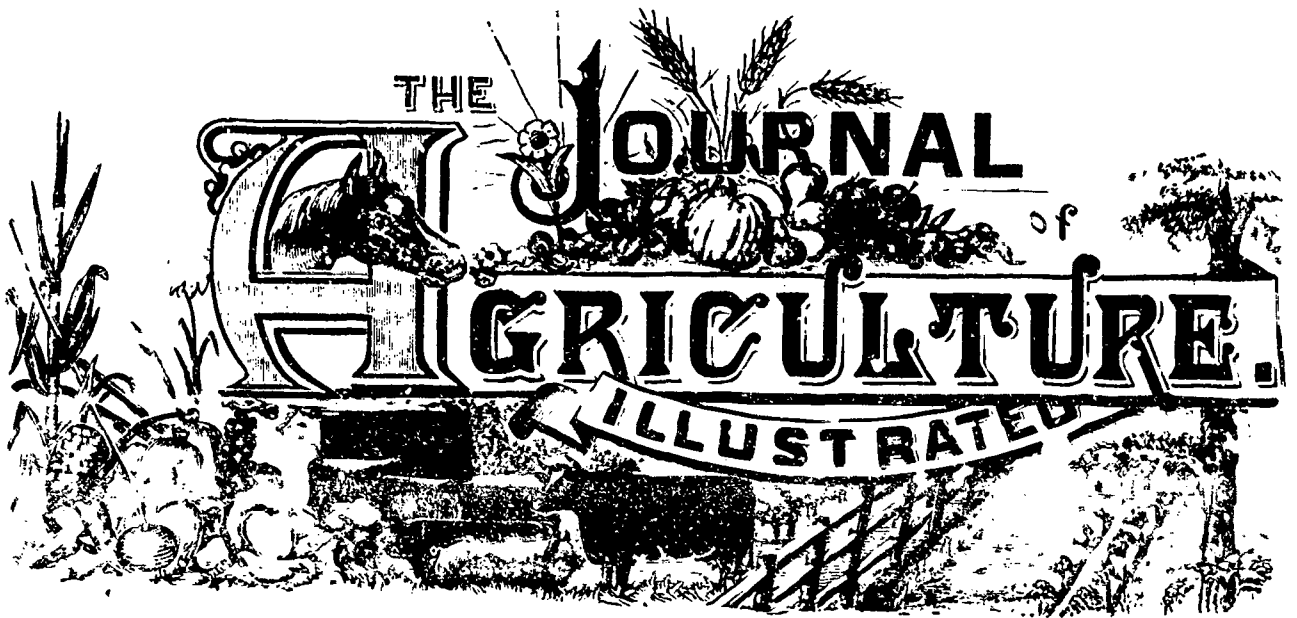
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Table of Contents.

Potatoes.....	17
De Omnibus Rebus.....	21
Our Engravings.....	21
Competition of Farms.....	22
Analysis of Wood-ashes; Sugar beets, &c.....	23
Description of Mr. D. A. Jones' Apianian Establishment at Beeton.....	24
Foods for Stock.....	25
Silage Stack and Press.....	26
Competition of the best cultivated Farms.....	27
Storing Cabbage.....	28
The Chicago Show.....	28
City Milk Tests.....	29
The Poultry-Yard.....	29
Educated Farmers.....	30
A Famous Cheese-Maker.....	31

POTATOES.

Box 23, P. O. Sorel, P. Q., December 28th, 1885.

The potato, *solanum tuberosum*, belongs to the family *Solanaceæ* of Jussieu, *solanum* being used by Pliny as another word for *strychnos*, the *nightshade*. The family is a remarkable one; examples of it are found in most part of the world, especially within the tropics. At first sight, this order seems to offer an exception to that general correspondence in structure and qualities which is so generally characteristic of well defined natural orders, containing as it does the deadly *nightshade* and *henbane*, and the wholesome potato and tomato; but a little inquiry will explain this apparent anomaly. The leaves and seed-capsules of the potato are narcotic; the tubers are wholesome when cooked. De Candolle, the French agricultural chemist, remarks of this family in a passage, which I translate: "We must not lose sight of the fact that all our alimentary matters contain

a small proportion of a stimulating principle, which, if it were present in a larger quantity might be injurious to health, but which is necessary to them as serving as a natural seasoning." The leaves are all, in fact, narcotic and exciting, but in different degrees, from the *Atropa Belladonna*, which causes vertigo, convulsions, and vomiting, *tobacco*, which as all young smokers know, produces the first and last of these symptoms, *henbane*, and *stramonium*, &c. (1) If any one of my readers will crush a leaf of the potato or of the tomato, he will find that the smell is exactly the same as that of a crushed leaf of green tobacco.

"The wild potato," says the illustrious Darwin, "grows on these islands—off the coast of Chili—in sandy, shelly soil near the sea beach. The tallest plant was four feet in height. (2) The tubers were generally small, but I found one, of an oval shape, two inches in diameter; they resembled in every respect, and had the same smell as, the English potato; but when boiled they shrank much, and were watery and insipid, though without any bitter taste. It is remarkable that the same plant should flourish on the sterile mountains of Central Chili, where a drop of rain does not fall for six months, and within the damp forest of these southern islands."

The potato was generally cultivated in America at the time of its discovery, but it is only a few years since its native country, Chili, has been discovered with certainty. It is asserted that Sir Francis Drake introduced it into Europe in 1573, but this is mere tradition, as it appears probable that the Spaniards had established its cultivation in Europe before this time. It began to be grown in Ireland about 1610, and in France about the middle of the eighteenth century. The modern English name, potato, is evidently derived from the Indian *batata*, whence the vulgar French *patate*, commonly heard in Guernsey and Jersey, as well as in Canada, where a *k* is sometime substituted for the letter *t*.

(1) Vertigo, yes, and pretty severely, as I can testify, but the other I never experienced.

(2) I have seen the tops of the *Champion* potato exceed four feet in length.

JERNER FOST.

A. R. J. F.

Composition of potatoes

Weight of crop...	Total Ash.	Nitrogen.	Sulphur.	Potash.	Soda.	Lime.	Magnesia.	Phosph. acid.	Chlorine.	Silica.
Tubers—6 tons....	12.6	4.7	2.7	75.4	2.0	2.9	5.7	24.1	3.5	2.9
Haulm—2 "	5.0	2.0	2.1	1.1	2.0	22.7	12.4	2.7	1.9	2.1
	17.6	6.7	4.8	76.5	4.0	25.6	18.1	26.8	5.4	5.0

You will see by the above analysis that potatoes require plenty of nitrogen, potash, and phosphoric acid, and a moderate quantity of magnesia, of which, with the other remaining matters, there is, almost invariably, plenty in the soil.

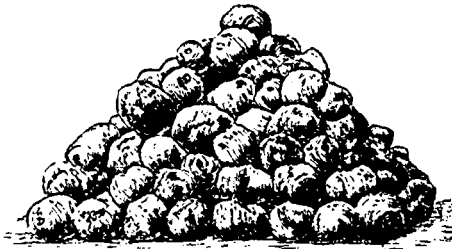
ance of one or two crops that no actual dressing of potash in a separate form may be required; but, as a general rule, I feel convinced that the chief cause of the very poor yield of potatoes on the lighter lands of the older settled parts of this province is the absence of this most necessary plant-food. And, observe, we know now that no analysis of the soil can help us in the least: the chemist may find plenty of potash in the soil, but if it is not in an available form, there might as well, as regards the effects on the immediate crop, be none at all. The soils on our farms, unlike those in England, do not vary much, which makes experimentalising here a much easier job than with us, where frequently four different qualities of land are found in a field of as many acres!

It would not cost much to try whether potash, or indeed any other plant food, is wanting on one of our farms. You only want six plots of ground, say eleven yards square each, and treated thus: (1)

SERIES OF EXPERIMENTS MADE ON POTATOES IN 1869.

The heaps correspond to the weight of the different crops.

NORMAL MANURE



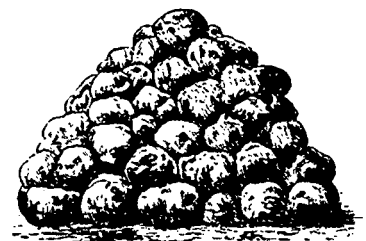
YIELD PER ACRE.—6 tons 8 cwt.

WITH UT PHOSPHATE.



YIELD PER ACRE.—6 tons.

WITHOUT LIME.



YIELD PER ACRE.—5 tons 8 cwt.

MANURE WITHOUT NITROGENOUS MATTER.



YIELD PER ACRE.—4 tons 14 cwt.

WITHOUT POTASH.



YIELD PER ACRE. 3 tons 18 cwt.

WITHOUT ANY MANURE.



YIELD PER ACRE.—1 ton 8 cwt.

There are, generally speaking, 75 parts in the hundred of water in the tubers, and the "albuminoid ratio" is 1:10.6.

M. Ville, as the result of his experimental plots of potatoes, found that the yield from the different manures was as follows: (see engraving).

	tons.	cwt.
(1) Normal manure...	11	3
Manure without lime	8	4
" " phos. acid.....	6	6
" " nitrogen	5	18
" " potash	2	2
Soil without manure	2	14

So, at all events on the soil at Vincennes, France, where these experiments were carried out, potash is the dominant manure for potatoes. Where large quantities of dung are applied to the land at moderate intervals of time, so great an amount of potash will be left in the soil after the sever-

(1) Normal manure contains nitrogen, potash, phosphoric acid, and lime

No.	Manure containing nitrogen...	phos acid.	lime.	potash.
" 1.....	Manure containing nitrogen...	phos acid.	lime.	potash.
" 2.....	" " " "	do	do	
" 3.....	" " " "	do		do
" 4.....	" " " "	do	do	do
" 5.....	" " " "	do	do	do
" 6.....	8 cwt of dung..			
" 7.....	No manure			

Thus, you will make the land analyse itself, and satisfy your own mind as to the constituents necessary to render it fertile. If I had my way, I would attach an experimental ground of this sort to every village school in the country. For these experimental grounds a piece of land should be selected which in its physical nature and degree of fertility represents the average quality of the land in the district. The proper quantities of manure for each plot would be:

	lbs.
Superphosphate lime.....	9
Chloride of potash.....	4.50
Sulphate of ammonia	8.50
Sulphate of lime (plaster)	4.50

(1) Eleven yards square= 4 rods= the fortieth part of an acre.

Ten bushels of dry hardwood ashes may take the place of the chloride of potash, and the superphosphate should be a plain combination of mineral phosphate of lime and sulphuric acid. Thus, the weight of the whole will be less than 28 lbs, and if you are curious in your researches, you can try a dose of 8 cwt. of common farmyard dung on another plot, and see what lessons the whole will teach you: they will be, generally speaking, the following:

1. By the comparison of nos. 1 and 6, proof will be afforded that 28 lbs of mixed artificial manures will produce as great, if not a greater crop, than 8 cwt. of farmyard dung.

2. On comparing nos. 1 and 5, it will be found that the suppression of a single substance, nitrogen, in the normal manure, will be sufficient to reduce very considerably the usefulness of the three others which constitute the manure.

3. In the general run of soils, particularly in the lighter ones, that nitrogen, used alone, produces a better crop than the minerals put together. If you look at the engraving of comparative yield of potatoes, taken from M. Ville's book on manures, you will perhaps better appreciate the halting description I have given.

I do not, however, advocate the principle of manuring land for potatoes with artificials alone. I leave that to M. Ville and other manufacturers of manures.

But adding certain quantities of chemicals and thereby to spread the dung of the farm over a larger surface is a safe practice. My dose for this crop would be .

	tons. cwt.
Dung.....	10 . "
Ashes 7
Plaster.....	. 2
Bones.....	4 bushels

The dung to be spread in the drills as usual, and the plaster dusted over the young plants soon after they are well up; the ashes and bones should be sown broadcast as early in the spring as possible, and well harrowed in, as potash in any form takes a long time before it goes to work.

Planting potatoes.—Potatoes are almost invariably planted after a white-straw crop. If cleaned from couch-grass and other root-weeds soon after harvest, so much the better. The autumn furrow should be as deep as the horses can manage to make it, and water furrowing must be attended to, for we must remember that this is the earliest root-crop to be planted in the spring.

Of late years, the grubber or cultivator has usurped the place of the plough in the early preparation of the land for potatoes. I still have a feeling in favour of cross-ploughing: I think it mixes the soil better, and if done when the land is in proper order, no ill effects will be felt from the operation. After the cross-ploughing, all work up to the time of drilling may be done with the grubber and harrows, and any weeds brought to the surface should be gathered and carted away.

Preparing the seed.—There has been a great deal of controversy of late years as to the mode of preparing sets for planting. Sets from large potatoes and sets from small ones; sets with one eye and sets with two or more eyes; sets of small whole potatoes, from whole middle-sized ones, and even from large whole potatoes, all have had their advocates. Last season by way of experiment, I tried sets with one eye only, and I am bound to confess that the crop was more than fair; but I cannot feel any confidence in the plan, though I should be puzzled to say why, probably my "old fogeyism" may have something to do with it, or the very small haulm that is thrown up from the one-eyed sets. The two finest crops I ever saw grown, one at Longleat, the Marquis of Bath's, of 640 bushels to the acre, and the other at Shirley Hibberd's of 800 bushels to the acre, were produced from sets called

"middlings" in the London market (uncut), which were about an inch and a half in diameter. The engraving annexed shows the ordinary way of cutting the potato for seed.

The state of the potatoes when taken out of the collar will



How a potato may be cut into sets.

depend upon the weather and on the state they were in when harvested. If the weather is mild and the cellar warm, the potatoes will probably have sprouted. If the shoots are long, they should be broken off at once, as there is no chance of their undergoing the process of cutting intact. The best state for them to be in is to have the germs just opening in the form of a bud: these will soon sprout after planting, and be some days earlier than the rest in forming tubers.

Sets for very early potatoes, either in the open air or for forcing, should be treated in the following manner: about the last week in March select middling-sized tubers and place them in shallow trays in a warmish room fully exposed to the light; the germs will begin to expand in a fortnight or so, and instead of being white, as in the cellar, they will be found to be of a fine greenish purple, short and stumpy; these should be planted at distances of say 20x9 inches apart, in very highly manured land, kept clean by shallow hoeing, but not earthed up at all. If set the last week in April, they should be fit for the table by the 18th of June—Waterloo day.

Forcing potatoes.—Not an expensive job at all where a good gardener is kept. Make a well shaken up bed of horse-dung, say two feet high, trodden down and made firm; eight or ten inches of earth will be enough, and the sets planted 18x7 inches. The frame should be a foot or fifteen inches deep, and, as a cover, matting laid over bent rods like a gipsy's cabane will keep the frost out and answer all purposes. The matting should be removed as soon as the morning frost is conquered by the sun.

Early sorts of potatoes.—For forcing, I know of but one kind that is worth a farthing—the *Ash-leaf kidney*.—The peculiar virtue of this tuber is that it is as good to eat when the size of a bean as the others are when ripe. The *Early-Rose* is gorgeously fine in August, by which time the *Ash-leaf* has matured and is past its best; but an unripe *Early-Rose* is hollow in the middle, soft, and pappy, while the immature *Ash-leaf* is in its most perfect state. So, I advise every one to plant enough *Ash-leaf* to last from the middle of June to the 1st August. I shall have no seed to spare this year, but next season I hope to have enough to distribute in small quantities to all my friends. There is a fair-sized early, or rather second-early potato, grown on the islands about Berthier, at Joliette, &c., called "*Ladies Fingers*." It is like the *Ash-leaf* in form but rather rounder; in colour, yellowish, whereas the *Ash-leaf* is white, and far inferior in flavour. Both kinds have very slight haulm, and will stand any amount of dung. Above all things bear in mind that earthing up will delay the formation of tubers, and that these very early potatoes are worthless when ripe; they are never *mealy*, but their flavour is perfect.

Continuing what I was saying about sets, I may remark that at Sorel it is the custom to plant small potatoes whole: not the tiniest of all, but the next-sized. As I remarked before, the practice is correct, but I wish the Sorel people would change their seed a little oftener. It is a much more important thing than they seem to fancy, and I know by experience that a judicious selection would make a difference of many bushels per acre in their crops. They need not go far,

for the heavy land round Chambly produces just what is wanted, and a mutual change of sets would benefit the farmers of both districts.

When sets are made by dividing large potatoes, they are apt to spoil if placed in a heap. They should be spread out thinly, and if to be kept for more than two or three days, a dusting of plaster will close the pores and, by preventing bleeding, will obviate all danger of heating, a neglect of this precaution has often been the cause of many a miss-plant. I know nothing more harassing to an accurate eye than a gap in the rows of any growing crop.

No means, since the prevalence of the potato disease, have been left untried to ward off its attacks; but hitherto all expedients to that end have failed of success. So there is no use in fiddling over your seed-potatoes with any quack nostrums brought round the country by those swindling rogues the agents. The disease has nothing to do with the seed. One thing, however is certain: the earliest planted crops of potatoes invariably suffer less than later crops. For instance: my Ash-leaf kidneys, planted this year on dampish heavy land, were ripe by the tenth of August, and not one single diseased tuber could I find among them. Two hundred yards off, on the same farm, where the soil changed to a dry sandy loam, Early-roses, planted a fortnight later, and not ripe till September 15th, were severely attacked. Some people, I see, make a fuss about whether the cut sets are laid in the drills germs up or down. It does not make the slightest difference.

Preparation of manure.— If you are fond of growing weeds, you can succeed to your hearts content by carting out the dung fresh from the stable door, and depositing it in the drills without any preparation. You will certainly save labour in the present by doing so, but consider what lots of seeds of that vile *mil-sauvage* (wild timothy) and other weeds have been carried into the mangers of the horses and cattle with the hay! You don't want them to grow again in your fields, and a turn of the manure heap will kill them fast enough. Don't turn the heap carelessly. If you have drawn out the dung of horses, cattle, and pigs, in regular order, you will find the mixture in good, fresh condition, easy to work, and only frozen at the sides. Now, in this climate we can't, as a general rule, cart out dung to the fields in winter, so we must take it from the yards at planting time, and turn it where it lay accumulating all the season. Shake the tougher pieces well, throw the outside inwards, and keep the heap regular in breadth and height to obviate irregularity of heating. If there is a fair proportion of horse-dung present, the heat ought to approach 140° F. in about ten days, and a few hours at that temperature will render all seed innocuous.

The land is, now, we will suppose, fit for drilling up with the double-mouldboard plough. You, as a rule, don't keep five pair of horses, so you can't go to work as systematically as our Scotch friends do in their own country, where farms are larger. You must make the drills first, stop the plough to cart out the dung and plant the sets, and then turn to again with the plough to split the drills: a bore, but it can't be helped. But even here there is a right and a wrong way of doing the work. If you dung more drills than you can plant and split before the sun has dried the dung, it will not mix so well with the soil as if it were covered in at once—that's easy enough to see—there won't be any loss of ammonia, as some fancy, because long before that time the ammonia has been fixed, but the quicker the work is got over, the quicker will the combination of earth, dung, and germ take place.

Again, in spreading the dung in the drills, how often did I see last summer heaps of manure laid down at ten and

(1) If you pass the roller over the piece, you will find the drilling easier to keep straight.

fifteen yards apart, to be afterwards scattered anyhow among the drills: equal manuring in this way is an impossibility. Another plan, and this I saw practised by a good Scotch farmer on the Richelieu, is to lay down the dung regularly in heaps along the centre of five drills. How can a man spread manure equally over so wide a surface? No, the easiest, best and quickest way is to draw out the dung into the middle furrow up which the horse walks, the wheels of the cart going in the two furrows on each side of it, and to divide the manure equally between the three drills. An active man, accustomed to the work, does not allow the horse to stand still at all, but makes him walk on slowly while he pulls out the dung with the dung drag. The back-board of the cart need not be kept on at all, as small loads are necessary in such soft ground. The spreader should shake to pieces every lump of dung, teasing out any that may happen to be ranker than the rest, trampling on the spread dung as he walks along, and keeping it within the limits of the bottom of the drill.

The width of the drill varies from 20 inches for Ash leaf kidneys to three feet for Champions. As to the Early-Roses, Vermont's, and the other ordinary sorts, twenty-six inches is width enough for them, and nothing is gained by additional width. All you require is room for the horse-hoe to work comfortably. In the drills I would put ordinary potatoes a foot apart, to give space enough for a stroke of the hand hoe between the plants. The sets should be placed in a cart on the headland of the field, and can be easily ladled into the baskets by means of a common iron or wooden shovel.

The dung having been spread, the potatoes planted, and the drills split, you can leave the field to take care of itself for about ten days. If you wish your potatoes to come up in the middle of the drills, it will then be time to harrow them down. They use a pair of saddle-harrows in Scotland, but I prefer the chain-or web-harrow, which destroys every seed-weed and leaves even grass and docks so naked that the hoers can hardly avoid seeing them. This chain harrow covers four drills at a stroke, the saddle-harrows only two.

As soon as the rows of potatoes are visible, pass the horse-hoe up the drills—not the "drill-grubber," but the horse-hoe, which will pour down the sides of the drills and leave only a narrow space of, say four inches, to the hand hoers. When the land is stony, the drill-grubber must be used perforce, but in all others soils the horse-hoe does much better work. For a good one see engraving p. 163, vol 1 of the Journal of Agriculture. I think I have mentioned in one of my previous articles that the one in question, the copy of which was taken from a card-board model, was drawn much too *leggy* in every way, but the general shape is a very effective one.

A few days after the horse-hoeing, the potatoes should be edge-hoed by hand. The earth should not be drawn away from the plants, but the hoer, with his feet on each side of the row, should *chop* the earth at the side of the plants, and stir it between the plants. As an active man, or even a woman, can get over an acre of this job in a day, it cannot be very expensive, and the good it does to the growth of the crop, especially on heavy land, is enormous: it loosens the earth, destroys the weeds that spring from seeds, and throws the root-weeds out into the interval between the drills, where the subsequent operations of the horse-hoe ensures their desiccation before their final interment by the earthing up. You may think you save money by neglecting this hand-hoeing; but I am convinced, from long experience in potato growing, that no one operation pays better, both in the increased yield of the potato crop, in the additional cleanness of the land, and in the improvement of the succeeding crop of grain from the perfect pulverisation the soil receives.

The horse-hoe will of course be kept going every week

until earthing up time. This should be done before the haulm is too long for nothing looks worse than to see horse and implement smashing through long haulm. Horse hoe frequently—a quick-stepping horse and man will easily get over four acres a day—and don't bother yourself as to whether there are weeds or not, the work will kill the weeds of course, but the main object is to stir the land up to the very plants that nine-tenths of the advantages of a summer fallow are secured, and, at the same time, a profitable crop of potatoes is produced.

Earthing up.—By this time, the land, if the horse hoeing has been deep enough—say five inches—will have resumed almost entirely its original form: all traces of the raised drills will have been obliterated. This is the best test I know of perfect cultivation, and everything short of this will tell tales both in the potato crop and in the next year's barley crop. All round the young plants the earth will be found tender and moist; the tiny roots will be sending out their fibres in search of food, travelling here and there, as their instinct leads them, through the easiest routes, and laying all their neighbourhood under contribution. Why confine the field of their research? I don't like earthing up at all, myself, for I am sure it is better to allow unrestricted pasturage to the plant than to shut it up in a narrow space. Before earthing up, each plant has twenty-six inches to forage over in liberty, why crush it up into a space of fifteen inches?

The only reason we can assign is that unless earth be laid on the top of the tubers, those that protrude from the earth will be turned green by the influence of the light, consequently, only sufficient earth should be used to prevent this exposure, and that little quantity should be thrown up by the double mouldboard plough in a flat form, not high and wedge-like as we generally see it. This finishes the cultivation of the crop, and it only remains to preserve what we have already taken so much pains about from injury and loss, whether in the field by insect depredators, or after harvesting by injudicious treatment in the cellar.

The Colorado beetle.—We all know the appearance of this brute: his appetite is his chief quality; fortunately this is not very discriminating, and he seems to like the flavour of Paris green. Well, let him have as much of it as he likes, mixed in the proportion of one dessert spoonful to two gallons of water, and sprinkled over the potato plants early in the morning or late in the afternoon. I don't like doing this work when the sun is in full force: in the summer of 1885 many plants lost almost all their leaves after the dressing, and I cannot help attributing the loss to the scalding effects of the hot sun on the arsenic-loaded leaves. I wish there was some easy test of quality for this poisonous drug: that sold at Sorel in the early part of the season of 1884 was very much adulterated, so when the purer sample arrived in 1885, many farmers made the solution too strong, and evil effects ensued.

Every country smith knows how to fit a "brander," as the Scotch call it, to a double-mouldboard plough, so there won't be any difficulty in extracting the potatoes when ripe. It will always answer to pull the haulm and cart it to the mixen-heap; large humps are driven up here and there all over the field, when the haulm is dragged out by the plough, which are, to say the least of it, unsightly. Gather the tubers carefully, as they are turned out of the drills, then pass the grubber across the drills, gather again, and the job is done.

Three or four days—dry days—after digging, the cellar may be filled. The heaps in the field, by the bye, should be covered with straw every night to avoid frost. In the cellar, don't forget that the potatoes want air, to afford plenty of which place bundles of bushes about six inches in diameter at every three or four feet in the bins: they should reach

from the ground to a foot above the potatoes. Never put wet potatoes in the cellar, if you suspect rotting, pick the tubers over at once. Sell at 30 cents a bushel, but at 25 cents give them to your cat. Boil them? Yes, for pigs, but to all ruminants give them uncooked. What causes the horrible stench in a stable of potato-eating cattle? I don't know, but I suspect the sulphur.

There is not much theory in this article, it is only, as far as I can give it, an account of my own plan of potato growing. If I were to sum up my advice to a young potato grower in the fewest possible words, it would be—*pulverise, pulverise, pulverise.*

ARTHUR R. JENNER FUST.

DE OMNIBUS REBUS.

Mushrooms.—These delicious flavourers of soups and sauces peremptorily demand salt; they won't grow without it. Mangels like salt too, and I have often seen edible mushrooms growing among mangels, when the coarse salt used for packing hides in South America has been used for manure.

Major Paul, of Ste Anne de Sorel, has just completed a stable for nine horses. Such valuable stock as he breeds demand as of right a better style of building than is usually seen about here. The stable in question is twenty-six and half feet square, built of the best material, with four inch air-spaces between the double-boarded walls, and consequently perfectly impervious to frost. The fittings are of iron, and the manglers and water troughs are most thoughtfully constructed. Here is a three year old filly, own sister to the trotter sold to Mr. Bourque for \$500 this autumn, which in the summer of 1885 will probably astonish some of our American visitors.

Artificial manures.—We really must try and get something done about the price of artificial manures. In England, at the present moment, they are selling for about 85 per cent less than they cost here. For instance, plain superphosphate containing 14 0/10 of available phosphoric acid is sold in Montreal for twenty-eight dollars a ton: at Liverpool, the same manure, guaranteed to contain 13 0/10 of soluble phosphoric acid can be bought for twelve dollars sixty cents!!! And mind, *available* and *soluble* are words of different meanings; *available* probably includes some soluble phosphoric acid and some reverted—when I buy a thing I like to know what it really is. Now "soluble guaranteed," means soluble in water, not in citrate of ammonia.

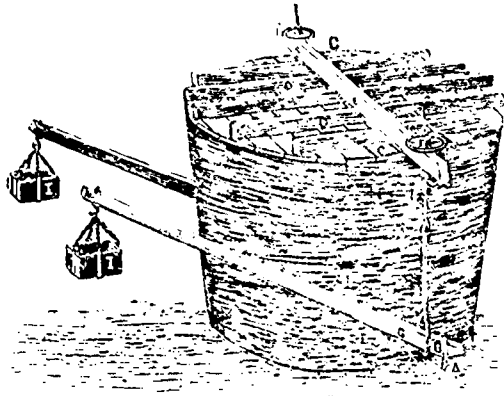
OUR ENGRAVINGS.

Silo stack and press.—I suppose we can hardly expect silo stacks out of doors in this climate to last longer than the first of December. Still this would be a gain of six weeks consumption of food before the covered silo and the root crops are attacked. The building is easy enough. Horses tramp the stack as it grows in height, the outsides, when once pressed, are cut round with a hay knife and thrown on the top, the press—a simple invention and not patented, at least in this country—is fixed, and that is all. I hardly think the silo will do away with haymaking, but there are

always odds and ends about a farm, grassy corners &c. which must be mown to prevent seeding, and these, not greatly worth the trouble of turning, &c., might be made into a silo-stack and help the young stook considerably.

Jersey heifers.—See article on.

Potatoes.—Effects of different manures on the crop. Mode of cutting sets.



SILO STACK AND PRESS.

Cheese is up to 48s. per cwt., in England—about 10 cents a pound. Where on earth the profit on exportation lies, I can't see. Our best is quoted to day at 9 cents.

Sir William Hart Dyke, the Chief Secretary for Ireland, has offered any of his labourers at Lullingstone Castle, Kent, small holdings at 5 shillings an acre. A marvellously liberal propine, at first sight, but, unfortunately for the excellent Baronet's credit as philanthropist, I happen to know that he has had *eleven* farms on his hands for the last four years: about 3,800 acres. Sooner or later, though I don't see how it is to be managed, the English labourer will have, at all events, a choice of renting, or not as he pleases, a few acres of land. (This is n't politics M. le Directeur.)

ARTHUR R. JENNER FUST.

COMPETITION OF FARMS.

The following is the first instalment of an article written by Mr. Edward Barnard, the Director of Agriculture of the province of Quebec, at the request of the Directors of the Agricultural Association of the County of Portneuf. It concerns the results of the competition of the best cultivated farms in the above county, and contains suggestions as to the better management of future competitions.

Plans of farms.—We begin to day the publication of the farms inspected by the judges. After a first visit to the twelve farms entered in the competition, it seemed to us impossible to form a correct idea of the system of cultivation followed, without having before us a plan of each of the contending farms, with its divisions, the rotations for several years past, the improvements, &c. We went back, then, over the county, and made, to the best of our ability, the accompanying plans of the prize-winning farms. It seems to us that, for the future, every competitor should be obliged to furnish the judges with a plan of his farm, on which should be inscribed the following description of each one of the fields:

1. Extent and divisions of each field, with the order in which they come.

2 Nature of the improvements, if any made, such as drainage, water-courses, stone clearing, &c.
3. The system of cultivation during the past ten years, and the date of the last application of manure.

A serious objection to the competitions is that no one, not even the competitors themselves, can extract any useful lesson from the contest. But, furnished with the plan we have suggested, the judges would be able to deliver their decision in a convincing form, to render it comprehensible to the parties concerned, and to show clearly what lessons might be derived by the neighbouring farmers from the competition they had witnessed, all of which advantages seem to us unobtainable without the plan we have put before our readers.

By means of a *figure*, corresponding with the different clauses of the programme, and a *letter* (a. b. c.), the judge, could mark on the plan itself the points due to each piece of land as he visits it. Thus, as to the fences, the judge as he crosses the field would make the following mark on the plan. IIIa, which would indicate that clause III of the programme had been perfectly fulfilled (o. would indicate less perfectly, and c badly). And so on for the rest.

CLAUSE IV. DITCHES AND WATER-FURROWS 10 points. This, we think, should be subdivided, so as to give five points to the ditches and five to the water-furrows. The competitor would then see more clearly any defects pointed out by the judges. Thus, we have found many farms where the ditches were kept in good order, but without nearly the proper number of water-furrows.

CLAUSE V. STONES AND WEEDS: 10 points.—It is clear that this clause should be subdivided. It would be very unjust to give as many points to a non-stony soil, as to a rocky one where the stones had been cleared away at a great expense, and the weeds destroyed.

CLAUSE VII. BUILDINGS AND IMPLEMENTS. 10 points.—Here again the clause should be divided, that the competitor may see wherein he is deficient. And, besides, it seems right to us that ten points should be assigned to each of the subdivisions on account of their great importance. On a well stocked farm the implements represent a great part of the capital invested, and it is the same with the buildings.

The programme itself, we think, might offer with advantage distinct points for each of the buildings, for the principal implements, and for the carts, &c. As for instance.

Barns.....	1.00
Cowsheds.....	2.00
Stables.....	1.00
Piggeries.....	1.00
Sheepsheds.....	.50
Fowlhouse ..	.50
Dairy.....	1.50
Dung-pit	2.50

In all.....	10.00

As for the points assigned to the stables, cowhouses, &c., it would be necessary to lay great stress on the *perfect preservation* of both the liquid and the solid manure; and that over and above the *dung pit*, which equally deserves special points.

CLAUSE VI. CATTLE: 10 points.—For the more equal distribution of these points, we have thought right to prepare the table No. 2.

It will be seen that the fowls are added to the other farm stock mentioned in the programme of the Council. We will, hereafter, show that some of the competitors have made good profits out of their fowls, in addition to the quantity used in their households.

We should like to see the Council adopt a formula some-

thing like the preceding table. This should be given in advance to the judges to be filled up, that the exact number of animals kept by each competitor may be shown. Clause VI seems to us of great importance, as it shows the quantity of available manure with great exactitude. It should, therefore, be stated in full and trustworthy detail.

CLAUSE XII. ROTATION: 50 points.—It is above all things necessary, in the distribution of these fifty points, to employ the plan of the farm marked with the rotation followed in each piece, its state of productiveness &c. The programme of the Council contemplates a rotation of at least ten years, with the farm divided into as many fields. But practically, not one farm in a hundred,—perhaps, not one in a thousand—is thus divided. It becomes, then, very important that the judges should have before them a plan of the farms as they are actually divided and cultivated. We have followed, in the distribution of the fifty points, the rules of the Council as far as we could, and assigned the points, in accordance with the *state of productiveness*; not to each number (sole) of the rotation, since we found in no one place a regular rotation, but in different fields. In the county of Portneuf, it will be observed that, in our judgment, the best farmers could still increase the produce of their farms by a third, while others of the competitors might double their crops by improving each of their fields in as great a degree as their ability will permit.

Hoed-crops and Summer fallows.—It has greatly troubled us to see how much remains to be done as to the destruction of weeds in the county of Portneuf. Except the potato-crop, no hoed crops are grown, except for purposes of competition for these prizes. There are no summer-fallows. Among the farmers of French descent, the summer-fallow is literally throughout the Province a thing unpractised. (1) Now without fallows or fallow crop, it is impossible to cleanse or pulverise the soil, and consequently the land is everywhere foul. In order to conquer this horrible fault, we think it would be well to offer twenty five points, say, to the farm showing the greatest extent of fallow crops, provided that this member of the rotation shall occupy at least a quarter of the ploughed land not in grass.

MEADOWS AND PERMANENT PASTURES.—We are inclined to think that throughout the province there has been a general neglect of both meadows and permanent pastures. The programme of the Council of Agriculture, based upon what is supposed to be a model system of cultivation, makes no mention of them. To manure grass land and so to bring it back to a good condition, is easier than to break it up to lay it down again—at least, that is our experience. It is this principle which demands recognition at the present time. The most rational means of getting it attended to properly is to throw into rotation all that part of the farm which is not suitable to permanent grass, and for part of the fifty points to be allotted to the grass land proportionately to its relative extent.

Drainage. The value of this most useful improvement is beginning to be appreciated in the province. Here, the five first competitors had drained part of their farms. Messrs. F. and A. Couture have done a good deal of drainage. We think it would be well if ten points were offered for the greatest extent of drainage, done as it ought to be, in addition to the stated quantity of five acres. (*arpens*—11 acres =13 arpents.)

Accounts.—We rejoice to see ten points offered by the Council for the most complete system of farm accounts, a

most important subject. Several of the competitors in the county of Portneuf have made a beginning.

Printed programmes.—The Council of Agriculture's formula for guiding these has been changed so often that the printed forms are at present rather puzzling. We would respectfully suggest that the study of the tables we have given above would not be thrown away.

PROVINCIAL COMPETITION.—In the majority of counties, the first prize winners at these competition are excluded from future contests. This is by no means the intention of the Council, as their programme shows. It has been suggested to us that a provincial competition for the best managed farms, from which all amateur-farmers who do not live by agriculture should be excluded, would be highly useful. The idea appears to us to be an excellent one, and we submit it to the consideration of whom it may concern.

In the next number of the journal we will enter more into the details of the competition in the county of Portneuf.

(From the French.)

ED. A. BARNARD,
Director of Agriculture.

Analysis of Wood-ashes; Sugar beets, &c.

Mr. Wilfrid T. Skaife, civil engineer, now in charge of the chemical laboratory at the Canada Sugar Refining Co., Montreal, has very kindly made, at our request, several analyses of Canadian wood ashes which we give below. These show how important it is for our farmers not to allow Canadian ashes to find their way into the States, when they would prove so useful on most farms.

The same may be said of phosphoric acid, in its various forms, which is generally exported from the country, instead of bringing back, every where, the fertility sold out annually with all kinds of farm produce.

The experiment with beets proves, once more, how suitable is our climate for the production of sugar-beets. And when the various elements of success in beet-sugar making are considered, we may repeat that under proper management, no country in the world offers equal advantages to those possessed by Canada for the production of sugar from beets grown on our farms. A fortune certainly awaits the men of knowledge and business ability who will go into the enterprise with the capital needed, and with such perseverance as is needed to command success any where.

Our best thanks to Mr. Skaife, who we hope will be heard from again in the *Journal of Agriculture*.

ED. A. BARNARD.

Nov. 20th 1885.

Dear Mr. Barnard,—I send you a partial analysis of ash from elm and from birch, and also of some spent char.

The only constituents of any practical value to the agriculturist are the potash and phosphoric acid, but I send some others I have determined, as they may perhaps be of general interest.

Commercial wood-ashes contain usually a considerable quantity of sand and will, of course, show a lower percentage of potash and phosphoric acid.

I hope shortly to be able to send you an analysis of some ash from maple and also one of the soot you spoke of. Meanwhile I forward you those I have mentioned, and also one of some sugar-beets grown by Mr. Tranchant of Berthier. They were only sown on the 1st of July last, and were taken up on October 26th. I consider that, under the circumstances, they are remarkably rich in sugar, and had they been sown a month earlier, they would have been equal to the finest grown

(1) And the Council of Agriculture recommends, as I understand it, a rotation of at least ten years, to a people who have, except potatoes, neither summer-fallows, nor root-crops!—A. R. J. F.

in Europe. They were in two lots, one from seed of Mr. Deprez and of the kind known as the "collet rose," and the other from German seed called Wanzlebener Noehzucht, which is in high favour among beet-growers in central Germany. All the roots were of an excellent shape and considerably over a pound in weight on an average.

Yours very sincerely,

WILFRID T. SKAIFE.

	ASH FROM BIRCH (Betula alba)	ASH FROM ELM. (Ulmus campestris.)
Lime.....	35 0 0/10	48.0 0/10
Ferric oxide	1.0 "	0.9 "
Potash	8.0 "	20.0 "
Phosphoric acid....	4 0 "	3.5 "
Sulphuric acid	1 0 "	1.4 "

Spent char. (1)

Carbon.....	20 00 0/10
Carbonate of lime	4 00 "
Phosphate of lime.....	74.00 " *
Gypsum.....	0.50 "

* 100 parts phosphate of lime contains 45.8 parts of phosphoric acid

Analysis of sugar-beets.

" Collet rose de Deprez "

1st. Lot.....	15.8 0/10 sugar.....	80.0 purity.
2d. "	13.4 " "	74.0 "

" Wanzlebener Nachzucht "

1st. Lot	13.2 0/10 sugar.....	70.0 purity.
2d. "	14 0 " "	71.9 "
3d. "	12.1 " "	72 0 "
4th. "	12.3 " "	68.0 "

Description of Mr. D. A. Jones' Apiarian Establishment at Beeton.

TO THE EDITOR OF THE ' JOURNAL OF AGRICULTURE. '

Dear Sir,—Having promised to write you an article on D. A. Jones' method of bee culture, I find that I cannot do justice to it in one article, so I shall extend it to two.

I shall confine myself to a description of his place, this time, and give you the details of his management later on.

On an average, he takes only five hundred hives, in the spring, from his bee-houses, and divides them up into his five yards, or apiaries, which are within a radius of ten miles from the headquarters, at Beeton. The outside yards are usually each managed by a student, who gets a small wage, and boards with some neighbouring farmer. But they are superintended by a practical apiarian who visits each yard every two or three days, and guides the student in his work. The yards are procured in the following manner:—Mr. Jones usually rents an acre or two from some farmer for a number of years, or else he procures the yard free, on condition that the bee-house, and fence around the yard, pass into the hands of the owner of the land at the expiration of the lease.

The home yard i. e., the one in Beeton, is managed by a foreman, who instructs those students who board in the village. The home yard is of course the most important by far,

(1) The remains of burnt bone after its having been used in the refining of sugar

it is thence that all the queens and colonies are shipped to customers, and there all his finest-bred bees are kept.

His queens are mated on his isolated islands in Georgian Bay, Lake Huron,—they are three in number (the islands), and are so isolated from the mainland and each other, that there is no possibility of the queens getting mated by any drones but those with whom they are placed.

Thus he can mate three breeds, such as the Carniolans, Holy Lands, and Italians, successfully, while if there are others, such as the Cyprians, he can pretty safely mate them in his home yard, and though he will not guarantee them as pure, still nine cases of ten, they will be so.

Besides his revenue from queens, hives and honey, he has a factory for the manufacture of apiarian supplies of all kinds. A wax house from which he turns out comb foundation, and a printing establishment where a local paper and the "Canadian Bee Journal" are printed.

I might here say that Beeton is situated in the southern part of Simcoe Co., and derives its name from Mr. Jones' industry. The little village has not only to thank Mr. Jones for its existence, but also for its present state of prosperity. As a Yankee once rather vulgarly but pithily expressed it. "He is just the pap of that village."

About a dozen students follow the course of instruction every year, arriving when the bees are first put out, which is generally about the first of May, and remaining till the end of October, when they are put back in the bee-houses for the winter. As I before mentioned, a few of them take charge of the outside yards, but the majority board in the village, and get instruction from Mr. Jones and the foreman, in the home apiary.

On rainy days, there is always work either in the factory, or in the wax house, so there is never any excuse for idleness. Students are paid for any work done outside of the bee-yard, such as packing goods, making section or brood foundation, clarifying wax, factory work, teaming, &c., &c.

Twice a week, or oftener if the students wish it, Mr. Jones lectures to them in the evening, but he does not confine his instruction to these lectures, he is always willing to answer questions when out in the yard, and if necessary to keep a student in his work.

But the lovers of this study, I must tell you, are not confined to the male sex. During several seasons Mr. Jones has had lady students, who, as a rule, proved better at the work than the men.

It is perhaps the only out door occupation in existence at which a lady can engage, and which will prove very remunerative if carried on properly, and in a good locality.

The hours for work, are from 7 a. m. till 6 p. m., one hour being given for dinner. Students are of course their own masters as regards time. But when once at work in the bee-yard they must finish, and also obey to the letter the orders given by the foreman.

During the extracting season, visits are made every day to the outside yards, and small boys are engaged to carry the combs from the hives to the extractor, and back again when empty. However, I am not going to describe the work itself, this time, as I have already taken up a good deal of your valuable space. In my next, I will try and embrace swarming extracting, and fall feeding.

T. W. SKAIFE.

Dear Jenner Fust,—The Jersey heifers in the inclosed engraving are an exact representation of my Canadian Jersey $\frac{1}{2}$ and $\frac{3}{4}$ bred—showing conclusively how impressive the Jersey is on the old French cow of this province.

I have just seen a very small Canadian—not over 600 lbs. live weight, which has given 300 lbs. of butter in the last twelve months. In October of last year, the owner, a curé, told

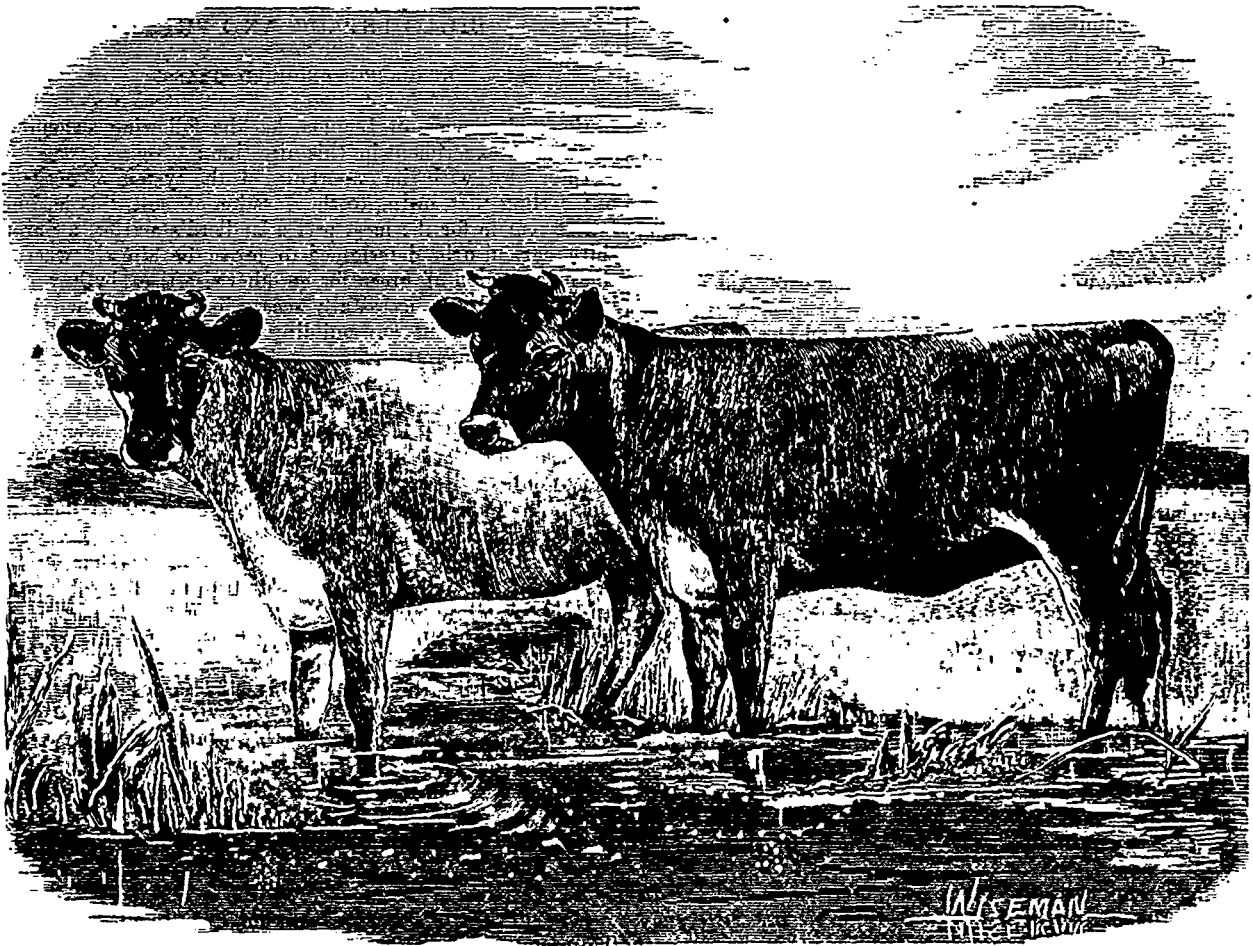
me he thought but little of her, a late purchase, and would sell her. He wanted a large milker from the Eastern Townships. I advised wetting the straw—her principal food - 30 hours before feeding, using a little salt, and adding 3 lbs. of meal a day. Six weeks after, the cow made six lbs. of butter a week, and milked to the very day of calving, in March last. She has been a well fed since; supplied the *presbytery* with milk cream and butter all the summer, besides giving 125 lbs. of butter to date (1st Dec.) which has been salted. The estimate of 300 lbs. is certainly not *overdrawn*.

Tout à vous,

ED. A. BARNARD

10 lbs. of hay cost	4 cents.
5 lbs. of straw cost.....	$\frac{1}{2}$ "
3 lbs. of crushed peas and oats. ...	$4\frac{1}{2}$ "
<hr/>	
Per day.....	9 cents. (1)

The hay and straw were chaffed fine, salted, wetted, warmed up thoroughly (not cooked) by steam, and then kept softening for an average of 30 hours. Water *ad libitum* in troughs warmed up by steam.



JERSEY HEIFERS.—The Property of James Blyth of England.

FOODS FOR STOCK.

TO THE EDITOR ' JOURNAL OF AGRICULTURE.'

In your January number, you have kindly replied to my queries, as far as they went. A few further explanations, however, appear to me necessary. 1. With men at a dollar a day, at least, and girls not to be found anywhere, and without any aid whatever at home, the growing of roots except our potatoes appears to me very expensive. Our potatoes we plant and grow entirely with machinery.

Last winter, the hay purchased cost me about \$8.00 a ton laid down in the barn, straw in the same proportion. (1) We had no roots. The cows in milk and the 2 year old heifers coming in were fed as follows, per day :

On this food, the cows, half Jersey and half French, continued to give rich milk until within six weeks of calving. They apparently were gaining in flesh all the time. With 35 head, kept tied up constantly from the 1st of Oct. to the 1st of June, we had not the least ailment or trouble of any kind whatever. Sixteen cows calved, of which four cows at their second calf, and seven 3 years do., and 5 two year old heifers with their first calf. All these calves were reared without any difficulty, showing the health of the cows and calves to have been perfect, it strikes me.

Now, how much better, if any, would these cows have been had they received say 20 to 25 lbs. of roots, in lieu of the peas and oats? 1. Would they have given any more, or even as

(1) But this year it would cost \$12.50.

A. R. J. F.

(1) Eleven and a half cents now.

A. R. J. F.

much butter? I doubt it, as the peas and oats are said to contain an average of

4 0/10 of fat	(on 3 lbs.)	0.12
16.6 of albuminoids	"	0.5
53. of sol. carb. hy.	"	1.6
or adding the fat (2.44) "	"	1.89
Whilst with 20 lbs. of roots (half mangolds half swedes)		
0.15 fat (20 lbs.)		.03
1.3 albuminoids (20 lbs.)		.26
7.7 sol. carb. hy.		1.54
or adding the fat (2.44) "	"	1.61

The peas and oats ration therefore is about 4 times richer in fat, and twice as rich in albuminoids. Now taking the cost of roots when fed after being taken from the root house, at \$3.20,—and I cannot raise them for that—the root ration would cost 3.2 cents or fully more—taking the comparative nutritious value of food—than the peas and oats. Am I right in my calculation?

Pray observe that we do not cook the food at all, altho' we warm it thoroughly by steam and allow it to soften completely before feeding, and this we find a great economy of food when compared with the dry feeding of common hay and straw, and on such food, with say about one lbs. of crushed peas and oats, the young stock thrive very well.

Many thanks for your suggestion respecting rape sown *in lieu* of buckwheat in order to secure a catch of clover in poor sandy soil. How would rape do if fed to milch cows morning and evening in the stable, in summer at milking time? I cannot keep sheep at present, being rather overstocked with cows and their produce. My alsike seed cost 13s a lb. last year. That certainly is not dear. Will the white clover catch in poor soil? You advise adding to 6 lbs. of alsike and 2 lbs. white clover to two bushels of orchard grass per acre. Won't that be dear? I strikes me three dollars a bushel was the price of orchard grass last year. This is a most important subject, which cannot be too thoroughly explained.

QUEBEC.

I don't propose to give the roots to milch-cows as a *substitute* for the mixed grain, but in addition to it. Surely my friend will admit that a variety of food is beneficial to all animals! If "Quebec" is so unfortunately situated that he cannot find hands to work his root-crops, I am sorry for it, and can only regret that an unlucky concurrence of circumstances should have settled him in such an unfortunate place. Of one thing I am sure: if there is no root-crop on a farm except potatoes, the state of that farm cannot be self-supporting. As will be seen on reference to page 23 of this number of the Journal, "the summer-fallow is literally unknown to farmers of French descent in this province." How, on earth, then, does our correspondent propose to clean the land at the end of a rotation without a root-crop?

Rape answers well for cows in the stable if wilted before feeding; but the intention of eating it off with sheep or young stock is to firm the roots of the grass sown with it.

White clover, as well as Alsike, will take on poor soil if manured with potash, phosphoric acid and plaster. Wood-ash, and the "Old Char" mentioned in Mr. Skaike's letter, p. 24, would answer well. At \$15.00 a ton, the price Mr.

Skaife gives me in a private letter, this remainder of burnt bones would pay well to use. Does Quebec seriously mean to say that cows giving milk can be profitably kept on fifteen pounds of hay and straw with three pounds of pease and oats a day?

Orchard-grass seed cost, as my correspondent says, \$3.00 a bushel, but it is well worth it. It is the earliest grass to grow in spring, it is latest in autumn, and it keeps on sprouting all the summer as fast as it is fed off.

A. R. J. F.

SILAGE STACK AND PRESS.

STACKING UNCURED GRASS.

Bell's Messenger, of London, has the following account of an English experiment in this direction:

Impressed with the importance of the system of ensilage, but feeling that, owing to the question of cost, this has bid fair to remain for the most part a landlord's matter, a Saropshire agriculturist determined to prove for himself whether the preservation of green forage otherwise than by hay-making could not be successfully accomplished by his own men and horses without any building or excavation at all, and without any apparatus for pressing. Early in July he cut with a grass-mower eighteen acres of grass and clover. A circular space of about 40 feet diameter was then marked out, and a green stack was built on this area. The process began by tilting cart loads in the centre, spreading the stuff about, and treading it down by means of a couple of horses led by a boy. The bulk of the stuff was fed to the stack in the usual manner by fork, from carts drawn up alongside. As the stack got up, it assumed the shape of a pyramid. When all the produce of the eighteen acres was on, about 5 feet all round was cut away, and the grass thrown on the top. The horses which had remained on the stack while it was being built were taken off by scrambling down an incline about two yards in width; the grass of this slide was then cut away and all thrown on the top, leaving the stack something like a very big plum cake. The next thing done was to cover it over with old cake and manure bags, and upon them was packed about a foot thickness of soil dug from close by. To prevent this earth layer from cracking, or from being washed away should heavy rain come, it was coated over with "rakings." The cost, not including horse labor, was £3 7s 6d, or 3s 9d per acre.

How did the experiment turn out? At the beginning of the present month (November) the stack was cut into, and was found in excellent condition, except a little on the side. This, it is known, can be avoided in future, at an expense of a few shillings. The stack is being fed as cut to a number of half-fat bullocks, who relish it and eat it greedily.

—GYPSUM AS MANURE.—A pamphlet by Mr. R. Warrington on "The Action of Gypsum in Promoting Nitrification," has been published by Harri-on and Sons of St. Martin's Lane. An elaborate series of experiments is here reported on the effect of alkalinity of various strengths in checking nitrification, and of added gypsum in restraining the power of alkalinity. One conclusion, among others, is that in agriculture the activity of dressings of farm-yard manure would probably be increased by the addition of gypsum to the soil.

STORING CABBAGE.

Cabbages are as easy to raise as turnips, and twice as valuable; yet ten acres of the latter are grown to one of the former. The chief hindrance to the extension of cabbage culture for winter and spring feeding is the mistaken idea that they cannot be preserved against frost except in a barn or other building specially prepared for them. The cabbage crop may, however, be stored in the field, or elsewhere, with absolute security, and that without much trouble or expense.

The close leaved cabbages, which include the many varieties of the common cabbage and the savoy, are the ones which demand storing. The savoy is a winter variety of the common cabbage, and does not ripen until it has been mellowed by a touch of frost. The farmer who goes in for growing such crops will probably have a third of his ground planted with early York or some such variety, a second portion with drumhead and other late kinds, and about the same quantity of savoy. The first will all be fed off, say, in October or early in November. Then the drumheads come to feed; and those which are not used before the hard frosts set in are stored, or put up for use in January and the following months.

Now, in every method but one of storing cabbages, we have found inconvenience. Taking them up and re-planting closely in a sloping manner, and covering them with straw; pitting them; hanging them up in a barn; turning them head downwards, and covering them with earth, leaving the roots sticking up in the air; in short, every scheme but the following was attended with great labour, and some of them forbade the hope of being able to preserve any considerable quantity.

The successful plan is this:—Throw up a sort of land or ridge with the plough, and make it pretty level on top. Upon this land lay some straw. Then take the cabbages, turn them upside down, and, after taking off all decayed leaves, place them, about six abreast, upon the straw. Then cover them, not very thickly, with straw, or leaves raked up in the woods, throwing here and there a spadeful of earth on the top, to keep the covering from being blown off by the wind. Only put on enough of straw or leaves to hide all the green, leaving the cabbage roots sticking up through it.

Stored in this way, cabbages of all sorts will be found to keep perfectly good and fresh until April and May, or even later. And not only do the cabbages keep better in this than in any other way, but they are at all times ready for use. They are never locked up by frost, as often happens with those pitted in the earth; and they are never found rotting, as is often the case with those which are laid with heads upwards and their roots in the ground. Savoy, which are at once the best in quality and the best to keep of all winter cabbage, may be stored in the same way.

To preserve cabbages thus would, in many cases, be of great use in southern districts, and of still more use in the north. Sometimes a quick succession of frost and thaw will commence and completely rot every close-headed cabbage, even in the south. Indeed, no reliance is placed upon cabbages for use as a cattle food later than the month of December. The bulk of this crop is so large that storing in buildings of any sort is not to be thought of. Besides, the cabbages so put together in large masses would heat, and quickly rot. In some gardens, indeed, cabbages are put into houses, where they are hung up by the heads, but they wither in this state, or soon putrify. By adopting the mode of preservation recommended above, however, all these inconveniences are avoided. Any quantity may be so stored, either in field or in gardens, at a very trifling outlay, compared with the bulk of the crop. (1)

(1) This plan of storing cabbage answers perfectly well in our climate.

A. R. J. F.

THE CHICAGO SHOW.

As was to be expected, the dairy exhibit at the Fat Stock Show was almost wholly from the Northwestern States, only four exhibits of butter being from Indiana and one from Ohio, and one lot of cheese from the latter State, Illinois and Wisconsin being by far the most conspicuous localities displayed for the entry cards. It was not until Monday that interest began to centre upon the dairy departments. The managers decided to let the imitation butter manufacturers of Chicago exhibit; but the wrath of the dairy convention was so enkindled that the Board finally gave out that the exhibit of oleo, &c., would be separate, and in the interest of fat stock products, not dairy. A large room was assigned them, and on Monday two or more tons of oleo, butterine, neutral lard, &c., were most attractively displayed, and a pressing invitation spread abroad for all to see their goods, and judge of their purity. Comparisons then being in order, there was a rush, first to the display of genuine dairy products, and then to the rooms of the butterine exhibitors. The bogus goods were in very way made to appear like dairy goods, and so closely did they imitate in color, texture and flavor, that two-thirds of all the visitors straightway "wagged their heads," and pronounced the whole oleo exhibit a "trick;" thought the samples shown were really creamery products, simply labeled oleo and butterine.

The Board excused themselves for their action by pleading that many of the creamery men in the Northwest were using "neutral oils" in the manufacture of creamery butter, and hence they had a right to recognize the fact, that bogus butter was at least an article legitimately connected with a fat stock show. This brought out Col. Littler, Secretary of the National Butter and Cheese Association, who challenged the State Board of Agriculture to make good their insinuation, and give the names of their informants, as well as the names of the creamery parties who were using neutral oil in the manufacture of "pure creamery butter," saying that it was a charge that must, unsupported, work a grave injury to the dairy interests of the State, and of the whole country.

Among leading prize winners were: *Best Creamery butter*—McCray & Kessler, Kendallville, Ind; *Dairy Butter Made at any Time*—Mrs. P. G. Henderson, Central City, Iowa; *Best Granulated Butter*—C. E. Feakins, Kirkland, Ill.; *Best Butter Made in Illinois*—W. A. Boise; *in Iowa*—Summerfield Creamery Co.; *in Michigan*—J. T. Clarke; *in Minnesota*—N. D. Holms; *in Wisconsin*—T. P. Thorpe; *in New York*—Smiths, Powell & Lamb. *Best Cheese*—Frank Holms, Minnesota. *Best Creamery Cheese*—A. J. Decker, Fond du Lac, Wis.

In the machinery department, there was no end of inventions, from the "whirligig" creameries to the tin pan, and so in churns and refrigerators, &c. There was a fine display of creamery apparatus, and gallons of rennetine, butter color, and butter keepers. All the leading makes of creamery apparatus were shown, including all the old time favorites. Churns were revolving, butter-workers were kneading imaginary pats of butter, and agents' tongues were actively making all sorts of seeming impossibilities seem plain.

On Wednesday the Elgin Board of Trade presented the State Board of Agriculture with a long list of resolutions, the gist of which was that the State Board had acted unwisely in admitting a "bogus" product for exhibition, and that the charge that oleo oil was used in the creameries was false. The Board did not reply, but the fat stock men did, in general terms that all oleo butter was good, that nearly all dairy butter was bad, that oleo butter made beef cattle worth \$3.50 more per head, which was more than the farmers lost on butter, and that the State Board should pay more attention in

the future to oleo butter, and advance it by their official influence, to a recognized agricultural product. So the matter rests.

The officers elect of the National Association are: WASHINGTON WINSOR of New-York, president; Col. R. M. Litter of Chicago, secretary; and a vice-president from each of the twenty-nine State represented. J. G.

CITY MILK TESTS.

To the Editor of THE STAR :

SIR,—These samples of milk under preliminary test for cream are from fourteen taken in the city for determination of fat and solids. The English standard is 12.5 per cent. of solids of which 3 per cent. is fat. The standard adopted by most professors of agriculture, and the public analysts is 13 per cent. of which 3.3 is fat. I have determined the fat and solids of fourteen samples of milk taken from ten sources, most of them have been taken from one to two quart bulks in the homes of public men living within an eighth of a mile of the Windsor Hotel. It will be observed that only two are up to the English standard, and not one is up to the Canadian. Nearly all the samples are from cows fed on sloppy and too low grades of food, and several are suggestive of skimming. The following figures indicate the composition of the samples examined.

One was from Petite Côte, three from Lachine, one from Verdun, two from St. Laurent, one from Côte St. Michel and the others from Côte des Neiges.

MILK ANALYSES—SAMPLES FROM CITY SUPPLIES.

Cream.	Fat.	Other solids.	Total solids.
No. 1—18.6, p c.	3.24,	9.70,	12.94.
2— 7.5, "	2.02,	9.55,	11.57.
3—11.3, "	2.48,	9.70,	12.18.
4— 7.1, "	1.78,	9.62,	11.40.
5—13.0, "	2.73,	9.69,	12.42.
6—14. "	2.52,	9.85,	12.37.
7— 8. "	2.08,	9.81,	11.89.
8—12. "	2.88,	9.51,	12.39.
9— 6.5, "	1.32,	9.54,	11.36.
10—15.0, "	3.00,	9.66,	12.67.

JAMES CHEESMAN

Montreal, December 16, 1885.

Point St. Charles, Dec. 21st 1885.

MR. ARTHUR R. JENNER FUST.

Dear Sir,—I have often read with pleasure your writings in the *Journal of Agriculture* and would like to hear from you on a subject I am interested in. I and my brothers have a Dairy Farm on the Lower Lachine Road, the next farm to Messrs. Somerville, with whom I believe you are acquainted. A Mr. Cheesman has been analysing milk in Montreal, and in some ten samples he does not find one up to the accepted English standard (he has not as yet analysed any of ours). Now as you are an authority on such subjects, I should like to know if milk will stand as high a test in the winter as in summer if the English standard he quotes was from summer and winter's milk. As a slur thrown on dairy men as a class hurts our custom by creating a feeling of distrust on the part of the purchaser that the milk he is supplied with is diluted or tampered with in any way, or that

cows are not fed as well as they should be. Ours got ground Indian corn, bran, grue, oilcake, potatoes, and three feeds per day of hay, I think we do our best in the feed line. I enclose Mr. Cheesman's analysis and would like a letter from you on the subject. I think there is one point we would agree on, and that is love of the Shorthorn. We have cows sired by thorough-bred S. H. bulls the best milkers we ever owned. We have one at the present time that calved about 7th September, and at the present time she is milking 18 quarts imp. measure per day. If you are any time at Montreal and would send me word one day before I would be glad to drive you out to our place to see the stock.

Hoping I shall not cause you to much trouble for which I would be glad to make good in some way. I remain
yours truly,
SAM. PENNISTON,
Point St. Charles, Post-Office, Montreal.

No trouble at all, but what can I do in such a case? An analysis is an analysis, and the producer of the article analysed must bear it as well as he can. As for any difference between the test in summer or in winter, there can hardly be any, as all liquids tested would, if the analyst knows his business, be reduced to the same temperature before being tested. The food Mr. Penniston gives his cows ought to produce the very richest milk.

A. R. J. F.

THE POULTRY-YARD.

When and How to Commence.

EDS. COUNTRY GENTLEMAN—Every year finds a number of new beginners in poultry-keeping. Old ones drop out and others come in, and the greater attention to this subject and the wider knowledge thereon, as well as the improved methods of management, have the effect of stimulating interest and inducing many to take up the pursuit who have never done so before, and others to give greater attention to their fowls. This at once brings the first question which is generally asked, namely—"When is the best time to commence poultry-keeping?" To this I would say, either the spring or the autumn, the latter preferred. Usually, in the autumn first-rate stock birds can be bought at reasonable prices, whereas in the spring these are much dearer. Many new beginners, especially ladies, like to start in the spring, so that they can at once begin with the duties of chicken breeding. This is an understandable feeling, but it often leads to the waste of an entire breeding season. In the spring it is true, also, that by purchasing eggs and hatching from them, the first cost will be smaller, but then there is the long summer, the autumn, and perhaps the winter to wait ere they begin to be productive. Whereas, in the way I have already indicated, pullets can be bought at reasonable prices in the fall, for breeders are usually very desirous then to get rid of their surplus stocks, and these, if bought rightly—that is, young pullets hatched in March or April—should begin to lay at once and will probably continue doing so all through the winter. Thus there will come an immediate return for the outlay, and the fact of getting some new-laid eggs from the fresh stock will entirely make up for the annoyances which ever come to the new beginner. These words I am specially addressing to the ladies or younger members of the household, who perhaps, fired by what they read from week to week in your columns, have determined to revolutionize the poultry-yard, or to add it to the establishment, if there has not hitherto been one. With these it is surprising what a state of excitement there is when the first egg is laid,

especially if it is soon after the birds are introduced. General joy is felt, and the enthusiasm for the new venture is universal throughout the household. Sometimes I have known, however, by a mistake in buying, fowls obtained that have not soon commenced to lay, and then the disappointment has been very great. The eagerness with which the nest was visited at first, soon vanishes. The daily journeys thereto were regarded as a duty, but speedily lost their pleasure.

"Hope deferred maketh the heart sick," is just as true of poultry keeping as of anything else. Under such circumstances the zest of the business soon vanishes away. In this manner many a budding poultry keeper has been chilled at the outset, and such a frost of disappointment as this is very deadly indeed. Nothing can bring back the first glow of enthusiasm, as nothing can make to bloom again the withered leaf. For these reasons I suggest the autumn as the better time to commence keeping poultry.

Following this, the next question naturally comes, how to begin. If there are any good breeders in the district they are at all times ready to help with both advice and assistance. I have ever noticed this as one of the most pleasing things in connection with poultry-keeping. They themselves have known the troubles, the difficulties of novitiate, and can sympathize with such as are in a like condition. It is also in the interest of every poultry-breeder to encourage others to follow in his footsteps, and as a rule, recognizing this, they are always ready to give the fruits of their experience to those who are new in the pursuit. But the beginner ought to study the directions given in papers like the COUNTRY GENTLEMAN, which devote considerable attention to poultry subjects, as therein are to be found the wider experiences which can only come to those who have the opportunities of learning what others are doing. Each individual breeder should try as far as possible to apply the knowledge he may gain to his own special circumstances, not merely follow blindly what others have done. What is suited to one place may not be so to another, but the thoughtful breeder will, after he has got a fair hold of the business, be able to apply what he reads and hears. In this way we obtain new ideas and methods of management, whereas a blind following of the examples set before us would never result in any such discoveries. Nor should the novice be at all backward in asking. If he does not tell his difficulties it is impossible that any one can help him in them. In this respect he is highly favored, as he can get advice through your columns for the asking. But for these things, the path of the amateur would be very much harder than it need now be, and if he fails to get help the fault can only be on his own shoulders. I have known beginners to declare that they would not be indebted to others, but would find things out for themselves. This may seem independent, but it is excessively foolish. The wise man tries to get all the information he can from the experience of others who have been before him, and tries to improve on these for himself. That is the spirit I should recommend.

The primary step to take is to prepare a place for the fowls, and while on a farm it is seldom very difficult to do this, yet in most cases some preparation is needed even to adapt an existing place. I have but recently said something about movable houses, and need do no more than refer to that letter here. If, as is usually the case at first, a house already standing has to be taken, the great thing is to see that it is dry, well ventilated, though not drafty, and not too cold. If it is of stone or brick, it should be carefully pointed, and the roof examined, and if the insides of the walls are very rough, the crevices had better be filled up with mortar, afterward to be well whitewashed over with thick lime-wash, in which some carbolic acid has been mixed, three or four times. The object is to prevent, as far as possible, any harborage being

given to vermin. Nothing can give better shelter to these pests than an uneven surface on the walls of a poultry-house. The insects cannot be seen in the day time, but at night they come out on their predatory errands, to the utter misery of the luckless fowls, whose non-thriving is very often due to this cause alone, though it is seldom suspected.

If the fowls are to be given their freedom, that is, if they can have free range, the provision of the house will pretty well cover all the preliminary work. But if they must be restrained, it will be necessary to prepare some kind of fencing. As one of my most recent letters was on the subject of fencing, nothing more need be said on that score. It is just desirable to point out that the runs made should if possible be changeable, as the ground is very apt to become foul if the birds are kept long upon it. Many mistakes are made in forgetting this when the fences are being built. In fact, at first it is well not to go to any great expense. I was recently in the yard of a large breeder, who at great expense had put up large permanent buildings for his poultry. From varied causes he has given up breeding on so extensive a scale, but nearly all the houses are unsalable, simply because they cannot be removed. If they had been made in sections, that would have permitted their removal, they could have been sold at good prices several times.

I should strongly advise all who are commencing, to be content with small things at first, so as to learn the ins and outs of poultry-keeping, before attempting anything great. If a cock and five or six hens are obtained, they will give sufficient work to do, if the owner will give a good deal of study to them, yet will be quite within his power. By the breeding season he will have the whole thing in hand, and by setting all the eggs he gets, may increase his stock almost as much as he likes. This is a far better plan than trying to do all at once, which so often leads to failure. The demand upon the resources should never be forcibly made greater than the ability to meet them. The development of a poultry-yard ought not to be rapid, but rather gradual. This, I am well aware, is a hard lesson for many to learn, but a necessary one.

H.—England, Sept. 3.

STEPHEN BEALE

I think it is pretty clear that all the fuss about feathers is, like the black tongues and black switches of the Jerseys, nearly at an end. If beauty alone is desired in poultry, breed games or Hamburgs; for table, Dorkings or Plymouth rocks.

A. R. J. F.

EDUCATED FARMERS.

Some people imagine that farming requires very little outlay of brain power, but this is a great mistake. "I honestly believe," said one, who is himself a successful agriculturist, "that the farmer who will work his brains till noon, and his hands the balance of the day, will outstrip him who rises at five and toils till nine at night." Our most successful farmers are not those who work hardest at manual labour, they work, nevertheless, with all their energies. None are exempt from labour, but in all it is not equally well applied and directed. If we take any two men, physically equal, the one will accomplish most who excels in brain-power. Therefore, let that small enclosure within his own skull be cultivated as assiduously and as carefully by the farmer as is his choicest crop. Whatever farming may have been in the past, the time has come when the highest intelligence is demanded as a necessary qualification on the part of the agriculturist.

Book-farming, however, is decried, and "farmers are not

a reading class." We, on our part, neither under-rate the importance of the scientific study of farming. The one is needful to the other, and science is futile if it does not help practice to do its work better and cheaper. But there is one great want in most of our farm-houses, and that is the almost entire absence of agricultural literature, both in book and periodical form. The volumes one most expects to see on a farmer's table are generally conspicuous by their absence; and, will it be believed, there is many a farmer who does not take in a agricultural newspaper. Boys and girls grow up on the farm, and spend those years which will so much influence their future lives without ever once being led to realise the momentousness of what is before them. They grow up, too, without a taste for reading, and so miss a never-failing source of happiness, not to speak of mental culture and refinement. For all this, the want of suitable books and papers on the farm-house table is to be blamed. The bodily toilers come in thoroughly wearied, and often with a longing for relaxation of some kind; but there is no paper, and no interesting volume that they can turn to, and so they live within themselves, as it were, and in too many cases, sleep away their existence.

But just let the young farmer think for a moment of the forces, the properties, principles, influences, the laws, — developed and undeveloped — with which he must come in contact and understand if he would succeed. So far from being less dependent upon the arts and sciences than those engaged in other occupations, the farmer stands in need of a far wider range of knowledge than is requisite in almost any other business. And farming need not prove the unvarying round and monotonous life it is often said to be; for every operation on the farm is an incentive to inquiry and a stimulant to thought. Men of one idea cannot succeed in farming, and those engaged in it, the young especially, should lose no opportunity of adding to their present stock of ideas by reading, by investigating for themselves, and through intercourse with others. *Ex.*

If farmers were to read more, they would also write more to farm papers. Every one should be ready to exchange ideas with others. This does good all round. There are numbers of farmers who could write good practical articles if they would only do so. Let them try. Our columns are open to all such, and welcome. Oh, if they only would try!

A. R. J. F.

A FAMOUS CHEESE-MAKER.

The little dainty, soft cream cheeses are the chief delight of all French dairy products. Having eaten them in Paris cafés, and admired the array of fromages de Brie, Neuchatel, Gruyère, &c., in the great city market, and secured from the genial director-general of agriculture, Monsieur Tisserand, her name and location, I was off, one bright morning in May, on a trip to visit the gold medalist of soft-cheese makers. We reach Coulommiers after a 55 mile ride from Paris, through a model farming country of market gardens, vineyards, green pastures, and luxuriant grain fields. Rapidly we pass chequered hillsides, pleasant valleys, white sandstone houses with red-tiled roofs, tidy cottages, substantial farmsteads, and well-kept wood-lands.

Madame Decauville, the gold-medalist, widow, little, agile, black-eyed, energetic, proudly and merrily showed us her establishment. Her cows numbered 27 of which 12 were the calm-eyed Swiss, and 15 the deep-milking Normandies. The stable was as neat as anything in Dutchland, the floor white sanded, with clean, bright straw spread for bedding,

curled and braided in the rear in the manner seen in horse palaces. For food these petted bovines are served in winter with good hay, wheat, bran, and beet-root. But the grass of summer makes the best cheese, it being then high-coloured, like butter.

Madame's cheese being the best of its class, of course her method equals the best. Her cheese-rooms are in the basement of the house, stone-walled, cool, and as dry as such places ever are when the earth is the floor and fire is unknown. Fromage Coulommiers, Madame's gold medal production, is her trade brand. This cheese is of the Brie type, Brie being simply the name of the district. In shape the cakes are an inch thick, round, four, six, and twelve inches across. They are made of one-half milk and one-half cream, in this wise, though my plain recital has none of the charms of little Madame's formula, pointed with animation and enthusiasm. The milk is set for 12 hours, then skimmed; 12 hours later the skimmed milk is curdled with rennet; 24 hours after curdling, the curd and cream, in equal parts, are put together in the moulds (not mixed, spoonful by spoonful. The tin mould, topless and bottomless, rests on a straw mat—single straws laid side by side to cover a surface 12 or 16 inches, and held together by a woof of two or three threads. This mat is on a thin board, all resting on an inclined shelf to drain off the whey that escapes. When it has been two days in this mould, it is turned out upon another straw mat, which rests on a mat of osier, and lightly sprinkled with salt. It is turned every day till cured, which takes two weeks in summer and three to four in winter. It never feels the heat of fire. As soon as cured, this cheese of Coulommiers (the name of the town), the delight of epicures, is ready for use and will keep a year. Some prefer the more mature article for its piquancy, just as many think that women improve with age. Madame sends her cheeses to market, each wrapped in paper and in a little wooden box. To keep these soft cheeses, they should be imprisoned separately, under glass dishes, in a moist room, and turned daily; or if for but a few weeks, the papers may be frequently changed and the cheese kept in a cool, moist place. The ordinary cheese of Brie is made of whole milk, *i. e.*, about one-fourth part cream.

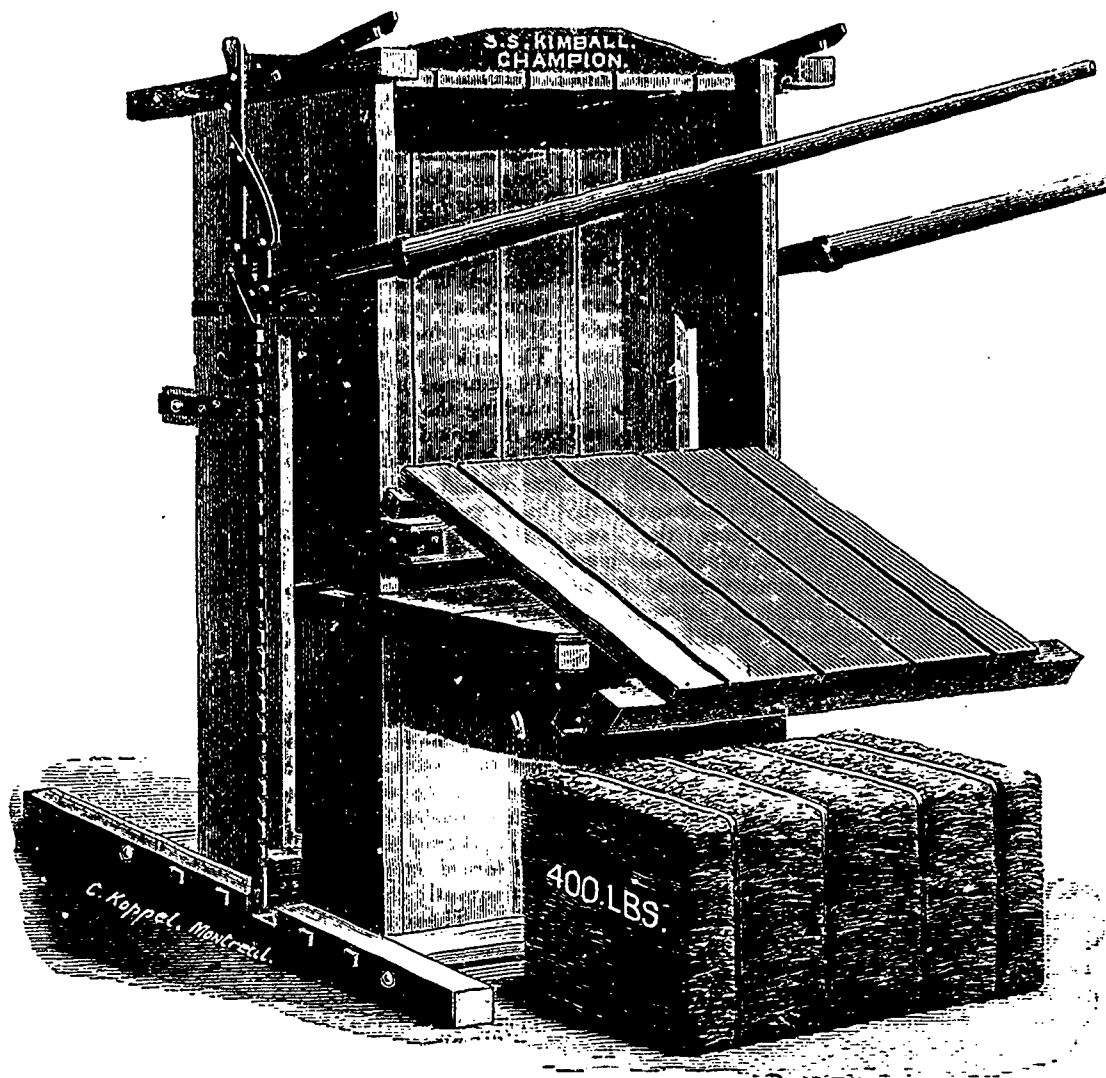
Madame Decauville's most toothsome product is cream cheese, also called white cheese, and fromage à la crème. For this the milk is set 12 hours, then skimmed, the skimmed milk curdled, then mixed with fresh cream by stirring in, equal parts, for the best grade. It is quickly moulded in any neat form, and enclosed in white muslin for marketing. Each "cheese" is about the size of a hen's egg, and sells for two to six cents, according to quality. These are very profitable, and would speedily make Madame rich, were it not that these delicacies must be eaten fresh, like strawberries. With an after-dinner coffee, no cheese can surpass this in fineness of flavour.

Madame Decauville is at least the perfecter of her system. She closely superintends the business in every part, from the growing of food-crops, her cows, and the care of the stables to the making and marketing of the finished product. By her skill, energy, and the use of business methods she has won an enviable success, independence, and the respect of the whole dairy world.—E. H. LIBBY, in *Philadelphia Weekly Press*.

Charles A. Green, editor of "Green's Fruit Grower," says "We are always glad to recommend the "ACME" "Pulverizer Harrow, Clod Crusher & Leveler. We use it more than any other tool on the farm, and we use no other "Harrow."

See advertisement on cover...

NON-OFFICIAL PART.



A NEW PRESS.

We do not mean a rinting press, but a new apparatus for baling up wool, hay, rags or other material requiring to be packed for shipment or convenient storage. There are several classes of presses of this kind on the market, each having their own style of construction and method of working. The principle of the one here illustrated, which has just been placed on the market, is sufficiently striking to make some special notice of interest to the many in the textile trades who require such appliances. The manufacturer, Mr. S. S. Kimball, of Montreal, is the inventor of the most successful pump and stone lifting machine ever made, being the lightest, simplest in construction, cheapest, and of its class, the strongest of all in the market. It is now being sold in all part of Canada and many are shipped to England and Scotland. Being thrown a great deal among farmers and produce dealers, and knowing the expensive character and clumsiness of most of these presses, Mr. Kimball turned his practical mind to the subject and decided that the power used so successfully in the "Champion Stump Puller" could be applied just as successfully to a wool and hay press, and the result is the "Champion" press. The power is applied by twin levers, as shown in the cut, each lever working a ratcheted bar, made of a peculiar kind of steel specially suited to bear a tension of this kind. The base of the lever, working in to the notches of the bar, lifts it up and it is secured at each step by a strong steel clevis which falls by its own gravity into each notch, the clamp holding the bar as it is raised. The lower ends of

the bars are attached to the end of a beam, which supports the floor of the press box and works upward in a slot in each side of the box, so that the contents of the box can be squeezed into one fifth, or less, of their original space. When the wool or hay is put in, the moveable side, which appears opened down in the engraving, is fastened in place by the clamps at the top, and is taken out when the bale is made up, which is done by running the bands between the planks of the box, these planks being placed about an inch apart for that purpose. Any kind of ties can be thus used, such as hoops, wire, withes and splints. There are three sizes made, the weight of the smallest being 600 lbs., and depth of box 6 ft., while the largest has a depth of box of 7 ft., giving a bale 4 ft long and 26 inches in height and width, the weight of the press being 800 lbs. The price of the smallest is \$125, of the middle size \$150, and the largest \$175. When it is known that most other styles of press range from \$300 to \$1,000, it will be seen that the "Champion" has the advantage in economy, and when it is known that many others weigh from a ton up it will be noted that it has the advantage in lightness, while a pressure of 40 tons can be exerted on the smallest size of the "Champion." Most others take from half a day to a day in putting up, while this has been erected and started to work within 25 minutes, and can be worked by one man power, so that it will also be seen that it has the advantage in convenience. Two men working can press 4 to 6 tons of hay, and a proportionate quantity of wool or rags, and the manufacturer, who we believe, guarantees his implement, is in receipt of high compliments from the first purchasers of the presses.