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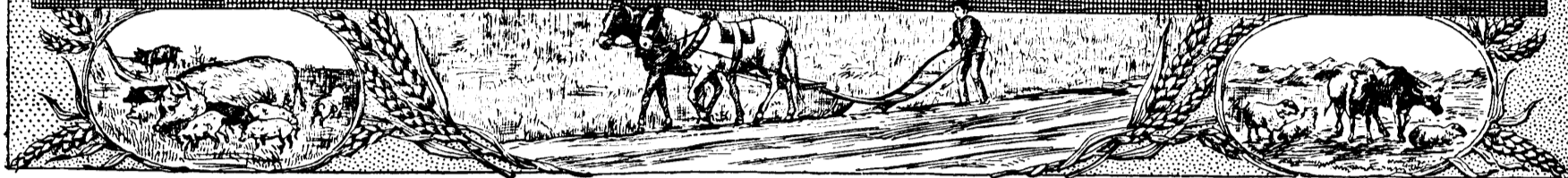
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Vol. 17, No. 6.

MONTREAL, JUNE 1, 1895.

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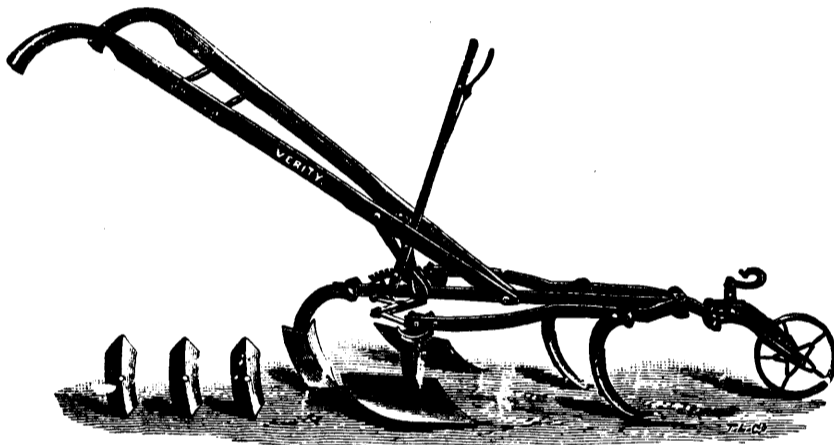
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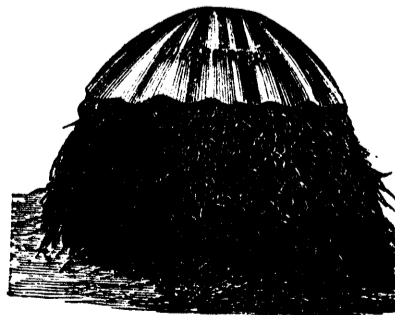
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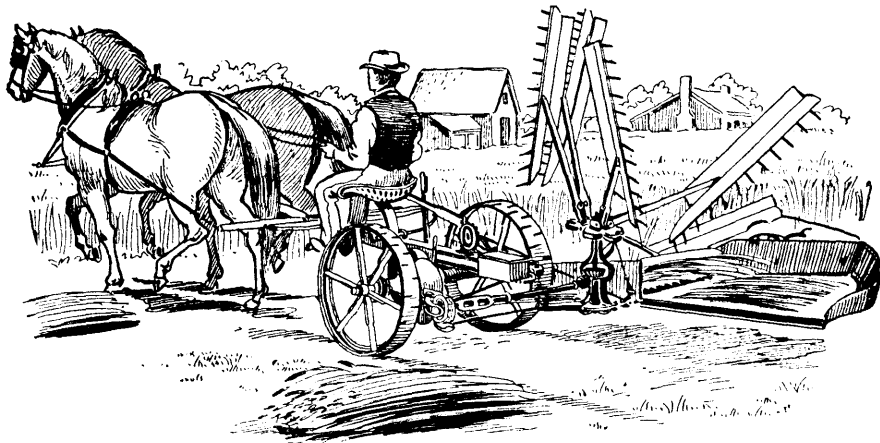
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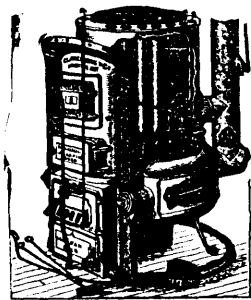
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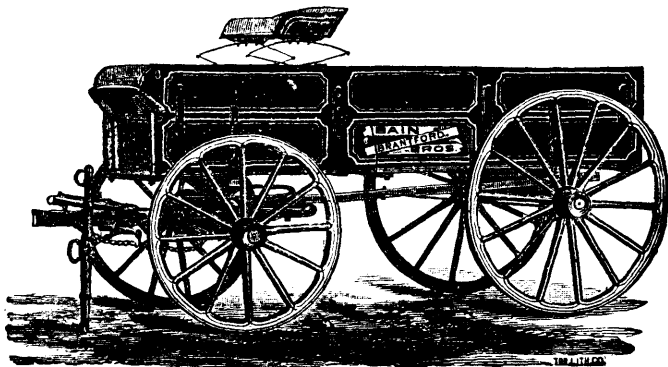
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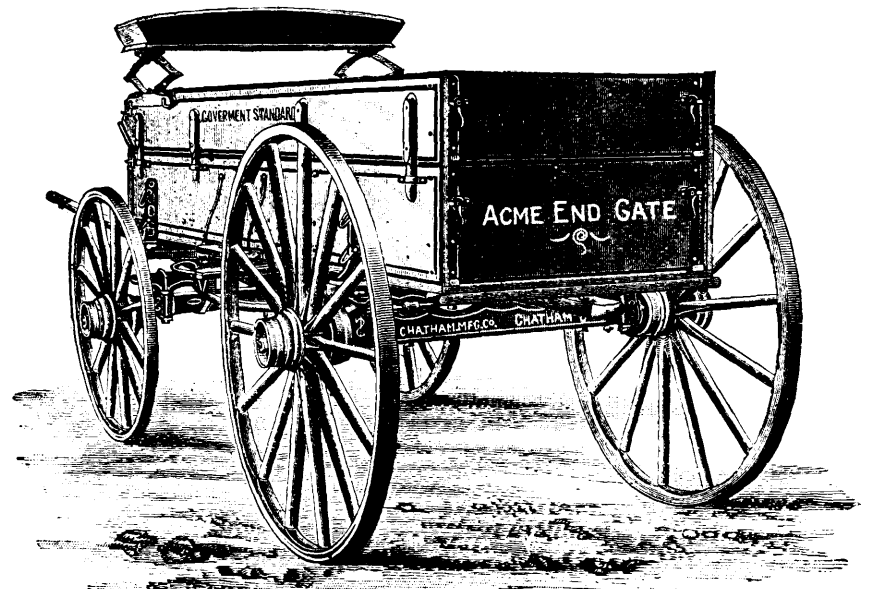
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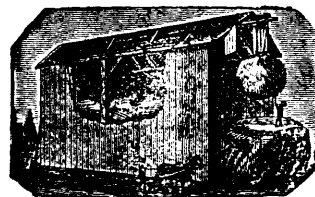
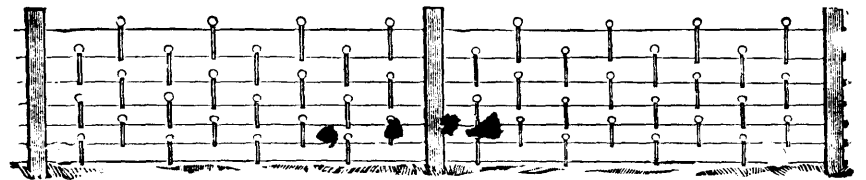
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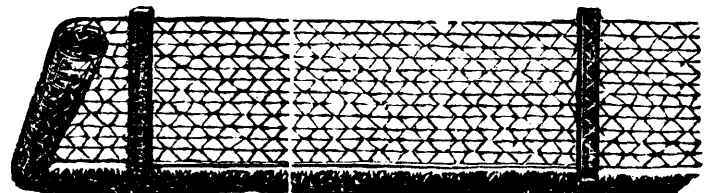


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THE ILLUSTRATED
Journal of Agriculture

Montreal, June 1, 1895.

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Notes by the Way.

Permanent pastures, in fact, all pastures, should be fed down close once a year; not absolutely gnawed down to the roots, but pretty close. Level feeding is at all times necessary, since, if any tuft of grass is allowed to run up to seed, that tuft will cease at once to be permanent.

The weather during the second week of May has been almost unbearably hot. Nothing like it since 1889. In that year the heat was more easily endured, as there was a fair breeze, but this past week the sky was cloudy, thunderstorms were lurking about, and the air was loaded with moisture: *muggy* is the only word to express it. Then came a fine, steady rain, which got well into the ground, doing an infinity of good, and converting what appeared to be a late spring into a very forward one. (1)

Lucerne.—There is a narrow strip of lucerne on the Priest's Farm, alongside of St. Mark St. et, Montreal, the growth of which during the last four days—May 9th—has been something prodigious. The red-clover, in the orchard on the other side, has only just started from the ground, while the lucerne is nearly 12 inches high, and will be fit to cut for green-meat next week. (2) It is a pity this very useful plant is not more cultivated. Even if it will not stand more than three years, the cost of seed is so slight, and the amount of labour required so trifling, that it should be tried on every farm where the soil is moderately free and the subsoil dry. It will not stand having its toes in the wet.

Names of plants.—Why do we English speak of the *Westeria* and the Americans of *Wisteria*? Both cannot be right. In the States, the black-red cherry used for making *cherry-brandy* is called the *Morella*, and in England the *Morella*! Now as the Latin *cerasus*, a cherry, is decidedly feminine in gender, we are clearly right in the latter case, though of course the word *morella* comes either from the Italian *morello*, a, blackish, or from the Spanish, *Moro*, a Moor. *Cerasus*, by the bye, is now *Kheresoun*, a town on the Black-Sea, which gave its name to our fruit. What does Mr. Alfred Jingle say our dear old county of Kent is celebrated for? "*Cherries, hops, and women*." Did not a Mr. *West* give his name to the climbing plant? Why then write *Wisteria*?

Names of things.—Again, many people, "on this side," write *linseed-meal* when they mean *ground oil-cake*. *Linseed meal* mean *ground flax-seed*. What is intended by this: I sowed an acre of wheat with 300 of phosphate? No one can form from this the least idea of what manurial constituents the fertiliser used consists.

The moon.—It makes no difference whether the moon is on the increase or decrease as regards the proper time to sow your seed or salt your pork. As to the changes of the moon affecting the weather, that is all nonsense, the moon is always changing.

Punctuation.—People are too often careless about punctuation. Where, as in the good city of Montreal, there

(1) Alas! the promise is broken—May 21st.—Ed.
(2) It was 18 inches high on the 15th.—Ed.

are necessarily so many compositors and proof-readers who do not understand our language thoroughly, the editor of a periodical like this has a good deal of unnecessary trouble in arranging the punctuation of articles sent for publication. A droll instance of carelessness in the use of the comma occurs to us. In, or about, 1835, the harvest was very late in S. E. England. Partridges were abundant, but the grain was still standing on the 1st September and at least a fortnight's law was needed to allow of the fields being cleared. A large land-owner, therefore published the following and had it placarded all over his district: "Lord Holmesdale will not shoot himself or his tenants before the 15th September."

Experiments on dairy-cows.—Prof Haecker, of the Minnesota Experiment Station has published some very work in the 1893 bulletin of that establishment. One very curious piece of practical information comes out in his record of the feeding and yield of 22 cows: *Dora* a cow weighing 1250 lbs., was the smallest eater the of lot, though some of the others only weighed 850 lbs. *Houston* 930 lbs., ate nearly twice as much as *Dora*. *Dido*, a shorthorn, cost the least for food, but *Sully*, of the same breed, though 50, lbs. lighter than *Dido*, was the heaviest consumer of the whole 22; yet her butter cost 12cts a pound less to produce than *Dido's* butter.

Mr. Haecker's conclusions from his experiments are:

1. The average cost of keep was \$38.00 a year.
2. The average product of milk was 6,400 lbs., costing 62 cts per 100 lbs., and 12½ cts a pound for butter-fat. 360 lbs. of butter a head per annum.
3. Productive quality depends more on type or conformation than on size or breed.

The 22 cows exploited as above seem to have been a very mixed lot: grade shorthorns, Holsteins, Jerseys &c., but all good milkers.

Carbo-hydrates again.—The "Journal of the Royal Agricultural Society of England" counts among its contributors many of the most skilful practical farmers of that country as well as some of the leading agricultural chemists. Among the latter, Sir John Lawes and Dr. Gilbert have been for at least fifty years in the constant habit of sending notes of their different experiments in cultivation, manuring, the feeding of animals, &c., and every now and then the Journal publishes an account of any corrections these two celebrated men may think is worth while to send to the Secretary: very few, however, of these corrections are of any importance; for the thoughtful, careful way in which the Rothamsted work is done, ensures almost perfect results.

Some time ago, we sent an essay to be read at the Dairymen's Meeting, which arrived too late, but was afterwards published in this periodical: it was entitled "are the Carbo-hydrates sources of fat in the animal economy, or are they only productive of Heat and Force?" In this essay, we quoted M. Jules Crevat's opinion, on one side, and the published accounts of the experiments of Lawes and Gilbert, together with the contents of private letters from several of the best known practical men in this and other countries, on the other side. (See *Journal of Agriculture*, 1894, p. 110.)

Now, if any of our readers are in receipt of the last quarterly number of the Journal of the R. A. S., they will

see, under the head of "The Feeding of Animals," an article by Lawes and Gilbert, intended, doubtless, as an addition to the permanent chronicles of Rothamsted. The experiments were made, some of them at least, many years ago, and their principal result was to dispose of the doctrine that food was valuable for fattening animals mainly in proportion to its nitrogenous contents. The Rothamsted experiments on hundreds of animals proved that, for fattening purposes, the carbo hydrates were the most important. So we suppose this question is settled.

Sheep-feeding.—Dr. Voelcker's account of the experiment in sheep-feeding at Woburn in the winter of 1893-4 is rather late in appearing. The object was to ascertain whether, in a season of short supplies of roots and hay, sheep could be advantageously fattened rapidly by giving them extra quantities of cake and corn, in order to economise the consumption of roots, and to do without hay. Three pens of twenty in each were fed on roots (swedes until the last few days) *ad libitum*, and a mixture in equal parts of linseed cake and griddled (?) barley. It was intended to give to Pen 1 double the quantities of cake and barley consumed by the other sheep; but they would not eat so much, and in the end they had consumed about 50 per cent. more. The sheep in Pen 3 alone had hay chaff as much as they chose to eat. The sheep in Pen 1 appeared to be ripe for the butcher first, at the end of eighty days; but, on being weighed alive, it was found that although apparently fatter, they were only slightly heavier than the sheep in Pen 2, and a little lighter than those in Pen 3. Dr. Voelcker has given a very full and careful analysis of food consumed, weights, increases, expenses, and returns. He concludes that slow feeding paid better than rapid feeding, and that the sheep which had hay paid the best of the three lots.

Raising calves.—We have reared a good many calves in our time, and fattened not a few for the London market. Whether fattening calves pays or not depends upon the demand. A good cow during the period of lactation should fat 3 calves, and even then be giving a fair lot of milk a day. For to fat a calf properly takes about 13 weeks, and at the above rate, the time for fattening 3 calves would be 40 weeks. But of course a really good milch-cow could support two calves at once, during a few weeks, as 8 quarts, or so, is quite enough milk to begin with, and 16 quarts a day is not an unusual yield, at least in our part of England.

Now, the carcass-weight of a 13 weeks old calf should be 18 stone for a cow and 20 stone for a bull, and, in our day, such a calf was worth about as much per stone of 8 lbs. as it would be now, i. e. 5s., so the one would sell for £4.10 and the other for £5.0, though, practically, the cow-calf always fetched a little more than the bull on account of the neater-form of the joints: small animals of every kind, if of perfect quality, always are more sought after than large ones. No really good veal tender and white in flesh, can be fed on anything but pure milk.

But when we come to talk of rearing calves for the herd, it is by no means necessary to give them full milk for more than ten or fourteen days after birth. So long as the skim,

(1) Griddled means cracked, not meale. Ed.

or separated milk is quite fresh and slightly warm (96°), and a little ground oats, with the husks carefully sifted out, or flaxseed meal, be mixed with it, the young one will do very well. We were surprised to see that Prof. Haecker allows his calves to suck the cow once or twice. If you want your cow to go blaring about for two or three days and the calf to be uneasy, restless, and disinclined to learn to drink from the pail, let it suck once! The cow should never see the calf if it can be kept from her sight.

As for letting a calf run with the cow, it is a wise plan if you want to lessen her flow of milk. A cow gives, say, 30 lbs. of milk a day; a young calf cannot utilize more than 12 lbs. properly; how long do you suppose the mother will go on providing 18 lbs. more than her offspring makes away with? Hence, the reason why Herford, pedigree Shorthorns, and Polled-Angus cows are such bad milkers. For years and years they have been sucked by their calves and dry themselves off in proportion to the decreasing demands of the calf.

Wean the calf as soon as born; feed 3 if not 4 times a day; teach it to eat good hay, oats, and linseed cake or crushed flaxseed as soon as possible, and you will have a thriving, active beast, with plenty of bone and muscle. As to its future as a milker, that depends upon other things.

By the bye, in *Hoard's Dairyman*, appears the following:

"ED. HOARD'S DAIRYMAN:—In a Danish veterinary paper is mentioned a case of calves being poisoned by cotton seed cake, but though the case was proved, no explanation has been found as yet. I mention the case merely as a hint to those who may have calves die in a mysterious manner."

More than once we have mentioned the case of the losses among the fine Guernsey herd of the late Sir John Abbott at St-Anne de Bellevue, which losses were attributed entirely to the use of cotton-seed meal for the calves. After all said and done, we pin our faith on crushed flax-seed steeped in boiling water and mixed thoroughly with the milk at first; later on, say, after the 6th week, a little pease-meal added to the flax-seed will do no harm.

Shorthorn cows.—Here are some nice Dairy-Shorthorns.

ED. HOARD'S DAIRYMAN:—By request of the Wisconsin Short-horn Breeders' Association, I am to furnish you the breeding of Short-horn cow, Sue Cady, registered in Volume 32, page 574, together with some other points in regard to her care, feeding, &c., during the butter test of 1893 and 1894. Now, while I am willing to furnish this matter for publication, I have hesitated to do so for the reason that this yield is below what I consider a first-class performance. I have owned six Short-horn cows that have made better butter records than Sue Cady, five of them that I tested for seven days, and one of them beat this cow almost a pound a day. They are all owned, with one exception, in this country, to-day, the exception being Belle of Reesville, owned by Mr. Greer, of Chicago.

	lb.	oz.
Belle of Reesville, seven days butter test.....	14	3
Lady of Meadow Spring, seven days test.....	19	1
Agawam, seven days test.....	15	15
Lady Ivah " "	16	4
Kisagotomi " "	14	14
Sue Cady " " in 1891..	16	2

We have had no more acceptable "copy" in many a day than Mr.

Ganes' report concerning his Short-horn cow, Sue Cady. But from our point of view, Mr. Ganes has omitted some important particulars. If there is such a thing in existence as a milking strain of Short-horns, there are a multitude of dairymen who want to know it and where it may be found. A phenomenal cow of that breed here and there counts for but little as compared with a family where 50% or more of its members can give a good account of themselves. What is the breeding of these cows that can make 14 pounds and over of butter in seven days? Do they belong to one family or many? And what is being done to perpetuate this milking quality?

Mr. Hoard and his editor must keep their eye tightly closed or they would have often seen in their exchanges that "Dairy Shorthorns, capable of giving 14 lbs. of butter and over", are to be found in almost every part of England, and that on pasture alone. We ourselves have seen scores, nay, hundreds of them. (1)

Mixed Farming in dry seasons.—It seems to me that such seasons as we have had for three successive years emphasise the value of mixed farming. I know that there are men who succeed best as specialists, but they are usually men of superior qualities, who would succeed almost anything; but the average farmer, with a farm not specially adapted to some particular product, will generally find it safer to grow a little of several things. This has always been my rule, and in the worst years I have abundant supplies for the family of almost everything needed, and when I sell the surplus and foot up the amounts, I have a fair showing. This plan is especially safe for the farmer who is out of debt and does not need to get a large sum of money at once to pay out, so much as to have a moderate amount of money at once to pay out, so much as to have a moderate amount of money come in often to meet expenses.—*Colman's Rural World*.

Good Work for Winter.—Manure making in winter is one of the best operations on the farm at that season, because labor cannot be bestowed in other directions as well as on the manure heap. It is not difficult to have all of the manure well rotted by spring, and there is less loss when it is in heaps than if allowed to remain spread out over the barnyard. Manure heaps should be handled several times, throwing the coarse material in the centre, where they will be heated and decomposed.

The point is made by a writer that feeding stock in the dark night and morning is not a good plan, for the feeder cannot see whether or not the stock is at its feed or off its feed.

Tomato culture.—In the experiments conducted at Cornell station it was made to appear that the best fertilisers for tomatoes are those which produced their effects early in the season. As to early and late seeding, it was proved by experiments of two years that plants which are set in the field early are less injured by inclement weather than is generally supposed, and that very early seeding and well prepared land appear to be advisable. But, on the other hand, early seeding requires especially strong and stocky

(1) In next month's Journal there will be a report of Mr. Baxendale's dairy of non pedigree-shorthorns.—Ed.

plants. As to training, it was found that the single stem system gave twice as much yield per square foot as the ordinary culture, and this system also showed greatly decreased injury from rot. Tomatoes will mix in the field, and even hybrids with the current type of tomato may arise spontaneously.

We need hardly say that we heartily agree with the above. We have practised the "single stem" system for 15 years and see no reason to try any other. It requires attention to the pinching off of the "drageons," but it pays, you may depend upon it.

LONDON MARKETS.

May 13th.	
Milch cows, per head.....	£15 to £23.
Beasts, per stone of 8 lbs..	4s. 6d.
Sheep, " " " 8 " " "	5s. 6d.
Lambs, " " " 8 " " "	8s. 0d.
Veal, " " " 8 " " "	5s. 6d.
Pigs, " " " 8 " " "	3s. 10d.
Butter, per dozen pounds.	
" Danish	90s.
" Normandy	98s.
Cheese, per 112 lbs.	
" Fancy Cheddar... ..	72s.
" Gloucester	60s.
Bacon, per 112 lbs.	
Danish, lean sizeable.....	53s. (top)
Irish, " " " " " "	67s. (top)
Hams, per 112 lbs.	
" Irish, small.....	94s. (top)
" American, small..	44s. (top)

London Hay Market.

Best meadow hay per load of 2016 lbs..	85s.
Best clover hay per load..	110s.
" Canadian " " "	76s.

London prices.—The prices quoted above for sheep, our readers will understand, are for shorn sheep. A good many arrived in April from South America, and although they were of inferior quality they caused English sheep to drag in price. Good, small tegs, i. e. last year's lambs, brought latterly 9d. a pound, and good heifer-calves as much. Spring lamb, was worth 1s. a pound.

Liverpool Manure Market.

Nitrate of soda p. 2240lbs.	£7. 15s.
Superphosphate " "	£2. 6s. 3d.

Apples, English per bushel 12s.

Hochelaga Horse Show.—The awards of prizes by the Judges. The awards of prizes at the spring show of the County of Hochelaga Agricultural Association were announced yesterday afternoon, and were as follows:

- Pure bred Clyde or Shire stallion, any age—Robert Ness, Howick, Lawrence Again, 1.
- Pure bred Percheron or Boullonnaise, any age—Haras National, Brilliant Bleu, 1.
- Thoroughbred stallion, any age—Dawes & Co., Lachine, Red Fellow, 1.
- Trotting stallion, any age—Antoine St. Germain, Westmount, Vrowski, 1.
- William Monteith, Point St. Charles, Marshal of France, 2; David Groig, Howick, Sherif Moscow, 3.
- Heavy draught stallions, any age, exclusive of Clydes, Shires, Percherons or Boullonnaise—Chas. Normandin, Boucherville, Banker Hero, 1; George Corboil, Pointe aux Trembles, St. Laurent, 2; Achille Beaudry, Pointe aux Trembles, Pointe aux Trembles, 3.
- Coaching stallion, any age—Archibald Stewart, Kent, 1; Robert Ness, Bushnel and Kordofan, 2 and 3.

Pure bred Canadian stallion—Louis Messior, Varannes, special prize.

Road customs.—Why do we sit on the off side in driving and pass on the same side of any carriage we meet? Nobody knows; but, in the Townships, we have often seen young men sit on the near side, which seems awkward, but is more likely to save a collision than the usual way of driving. The truth is that the coachman's eye, in any case, should be carried forward to the horses' shoulder, and, if he knows his business, he will be perfectly sure not to run any risk of a smash. No one but a badly taught driver ever "keeps his wheel in view": he would be too late to evade the shock of his neighbour's wheel if he waited so long.

ROAD CUSTOMS.—The 'rule of the road' is curiously different in different parts of the Anglo-Saxon world. When, for instance, an American who is riding or driving meets another rider or conveyance on the road, he turns to the right. The Briton, on the contrary, turns to the left. But if a walking Briton meets another pedestrian on the road or the sidewalk he turns to the right.

The rule of the road has become crystallised in England into poetic forms, one of which is as follows:

The Rule of the Road is a paradox quite:
For in driving your carriage along,
If you bear to the left you are sure to go right,
If you turn to the right you go wrong.

But in walking the streets 'tis a different case;
To the right it is proper to steer
On the left there should be enough of clear space
For the people who wish to walk there.

Another reading of the same rule is more epigrammatic:

The rule of the path,
To get well along,
Is 'keep to the right'
And you cannot go wrong.

The rule of the road
Is a paradox quite,
If you keep to the left
You are sure to be right.

The requirement to turn to the left is a matter of statute law in Great Britain, having been made a part of the highway act of 1835. In the United States the exactly opposite rule has been enacted into law in several states, and in the other states is so much a matter of common usage that a driver who violates it is responsible for the damage caused by any collision.

On the continent of Europe it is the general rule to turn to the right. Turning to the left seems to be an insular peculiarity of the United Kingdom.

Why opposite rules should prevail in England and in a part of the United States which, like New England, derived all its ordinary customs from old England, is not clear, but the reason for turning to the left is perfectly plain. It is the custom, not only in England but in America, for the driver to sit on the right side of the vehicle; and the driver who sits thus can keep his wheel in view, and also that of the passing conveyance, much better if he passes to the left, and keeps his right shoulder to the other man's right shoulder.

The practice of turning to the right when on foot is assumed to have grown out of the necessity, in rude and violent times, of keeping free the hand which must, in case of necessity, handle the sword or other weapon. But this consideration must have applied to horsemen as well as to pedestrians.

It may be, therefore, that the practice of turning to the left with vehicles has grown up since the times of peace and security on the road have made weapons unnecessary. In America we may have preserved the earlier usage of England itself, as has been the case with other customs that have been dropped there, but carefully preserved here.—'Youth's Companion.'

A new milk-food.—A new and, it appears, a very palatable food, prepared from milk has been put on the market in the state of Wisconsin. As it is noticed favourably in such a highly respectable and trustworthy paper as *Hoard's Dairyman*, we feel sure it is in no way related to the dreadful humbug we heard so much about two or three years ago. This is what the Editor of that paper has to say about it:

"We suggest to the manufacturers that they call this new product Lactage, or Eulactage, or Eulaitage. The first would signify simply milk-food, and the others, good or excellent milk-food. It is universally acknowledged that milk combines in itself all the essentials of proper food in almost perfect proportions. This new food, therefore, which retains all the milk solids, and differs from milk only in rejecting the greater part of the 87% water contained in milk, and adding thereto the necessary rennet and salt for preserving and seasoning it, might with great propriety be given a name indicative of its origin and value.

Butter contains but one of the milk solids, the fat; cheese adds to this the casein, or nitrogenous element; and with this last is now combined the carbonaceous element, more nutritious than either, milk sugar."

As to the name, *Eulactage* is decidedly preferable to the *culaitage*, though both are hybrids: how would *eulactage* (1) do?

Canadian cheesemakers.—Evidently, our cheesemakers are in high repute in the States. Here follows an extract from *Hoard's Dairyman*, part of a report of a meeting of dairymen in Wisconsin:

Mr. Johnson.—I never saw a floating curd until I came to Wisconsin from Canada. If you mature your curd enough in the vat, you need fear a gassy curd.

Mr. Dickson.—They have floating curds in Canada. I have seen lots of them. They have just as poor milk in Canada as they have here, and they wouldn't have any better cheese if the milk was not properly manipulated. You can make just as good cheese as they can in Canada, and you do at some factories to-day. The trouble with the factorymen here is that they want to hire a man for \$25 a month, and he has had only four or five months' experience, and, of course, he can't manufacture good cheese. You have got to manufacture good cheese if you expect to get the prestige. If you have got to go to Canada and get the men, I would advise you to go to Canada and get them.

Mr. Johnson.—In my own experience, I did handle better milk there than I have in Wisconsin. In five years I don't believe I ever had a cheese that was off flavor, and I can't say that, since I have been here; and I think I have tried and done my best to handle the milk to the best of my ability.

The Chairman.—This question of wages is a serious one. In this section of the country there are too many factories. I do not believe they will average five thousand pounds of milk.

(1) *eul* in Greek = good; and *gala* = milk.
Ed.

Water in roots.—We have often remarked in this periodical that there must be a mysterious property in roots that evades the researches of the chemist, and supported our opinion by contrasting the different effects in fattening cattle and sheep on swedes grown in Kent and the same kind of roots grown in Aberdeenshire.

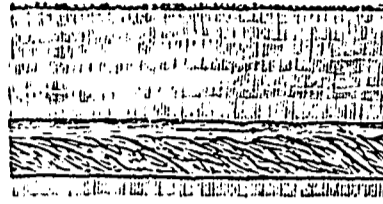
We were therefore glad to see the following letter, in the *English Agricultural Gazette*, on this subject, as it thoroughly agrees with our views and is really worth attention for its own sake. It has always struck us as a matter of surprise that no chemist, as far as we know, has ever even tried to account for the marvellous difference between the poor swedes grown in the neighbourhood of Montreal and the excellent, well-flavored swedes that come from the Quebec district.

"I was quite hopeful that some more of your correspondents would have found the subject of root-growing sufficiently attractive to have supplemented the remarks of Professor Wrightson, who, in your issue of the 25th ultimo, briefly referred to the respective methods of root cultivation in the North and South. A more thorough ventilation of this important subject, would not only prove interesting and instructive, but it would afford an opportunity of judging of the comparative advantages or disadvantages of farming in parts of the country distantly removed from each other.

In your issue of April 1st "G. S." has a few remarks on the question, and I fully agree with what he says. I think there can be no doubt at all that there is a great deal more in actual distance measured north or south from any central point than many people think, at least as far as the growth of roots possessed of the highest feeding properties is concerned. To the individual farmer, wherever he may be located, weather is so important an element to him that it may make or mar his fortune, but the absence or presence of rain and sunshine is by no means the only factor which counts in the perfect development of roots containing the highest nutritive qualities. I believe it is universally acknowledged that *Aberdeenshire* farmers, taken as a whole, are more perfect in the art of preparing cattle for the shambles than the farmers of any other county in the United Kingdom, and the reason of this is that it is a comparatively simple matter to them, owing to the superiority of the roots and straw grown in that county. The system of feeding is extremely simple. There is no laboured attempt to compound mixtures on the principle of the albuminoid ratio, no steaming, mixing, and fermenting of food. One man is put in charge of twenty or twenty-five bullocks. He is supposed to feed them three times a day with the greatest regularity, pull, top, and tail what swedes they require, and also to clean and carry the bullocks daily. I have seen as uniform and as good a crop of swedes in the South of England as I have in the North of Scotland, and yet the result after feeding is totally different. Why is this, I want to know? As far as I have seen the method of cultivation in both North and South is almost identical when the intention is to feed the roots to bullocks. Directly a North-country farmer begins root-growing and cattle-fattening in the South his superiority fails him. If there is nothing in distance measured northwards, wherein lies the difference? Some agricultural writers tell us that the 89 per cent. of water which swedes contain would be far more economi-

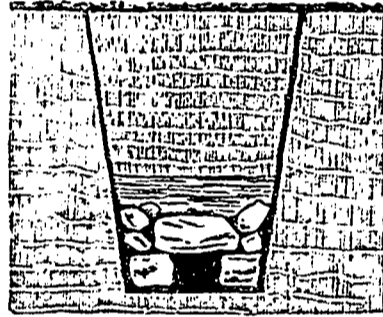
cally given direct from the pump than through the costly medium of roots. I have not heard of anyone who has been able to confirm this in practice" (1)

Drains.—Brush drains, as in the accompanying engraving, should have the tops of the branches down stream, but we utterly differ from the *Rural New Yorker* as to the covering to be placed on the brush, which that paper recommends to be straw. The straw would soon rot and very likely



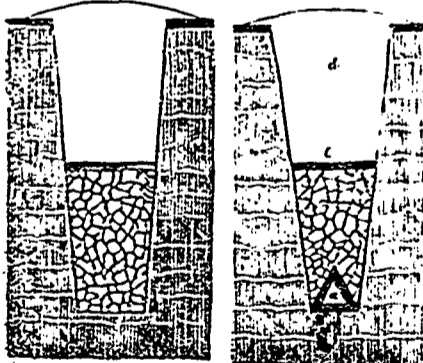
A Brush Drain.

choke the drain. The proper covering for all drain-conduits is the stiffen clay to be found handy. Any one who counsels straw or turf for this purpose evidently imagines that the water gets into the drain by filtration and enters by the top; whereas, all the water of drainage rises from the replete subsoil into the conduit.



A well laid Stone Drain.

Again; in the "Well laid Stone drain," any one can see that it will not be very long before the stream in the unprotected bottom of the drain will and must drive the earth along until the drain is choked. A stone drain is an expensive job at any rate, but if pipes cannot be had, and stone must be used, the "Small drain filled with broken stones" is by far the best and



A small Drain filled with broken stones.

The triangular coupled stone duct.

cheapest, though the "Triangular coupled stone duct" is by no means a bad one. The bottom of the last has, as will be observed, a flat stone which prevents all danger of the stream washing the earth up in heaps to the certain stoppage of the drain.

HAY AND PASTURE.

There are many points of interest and value in the paper on "The Management of Hay and Pasture" which Mr. Gilchrist read at a meeting of

(1) More on this subject in the next number.—Ed.

the Farmers' Club this afternoon. No doubt some of the statements made will give rise to discussion, as that laying down the hard-and-fast rule that "permanent pasture, if it is to be made the most of for grazing purposes, should never be mown." We are glad to notice that Mr. Gilchrist discourages the application of nitrate of soda to pasture; but it is questionable whether he is right in recommending its application in three years out of four to meadows growing hay every year, if he means permanent meadows. The quality of the herbage will be deteriorated in such meadows, just as he states that it would be in grazing pastures. We strongly demur to the statement that "it is a very great advantage to clean land before laying it down to pasture; but it is very questionable whether this is profitable." Some weeds may produce passable feed; but it is strange indeed if the intelligent farmer cannot do better by selecting the best grasses than by taking his chance of the value of weeds indigenous in his district. We are surprised that Mr. Gilchrist should have allowed his judgment to be influenced by the amusing character of the paradox representing a twitch pasture as an exceptionally good one. Exceptions prove rules, and there are cases in which (as in parts of New Zealand) twitch flourishes where it is difficult to establish better grasses; but this does not justify a teacher of agriculture in expressing a doubt as to the value of clean land to start with. On the whole, however, Mr. Gilchrist's advice appears to us to be well-considered. Differences of opinion are inevitable whenever questions of farm practice are under notice.

The weather.—Such heat as we have experienced in the past week or so is pretty rare. From the 3rd May to the 11th, both days inclusive, the thermometer varied from 74° to 88°, and in some places in the centre of the town, to 90°. The growth everywhere has been prodigiously rapid. We have seen nothing like it since the spring of 1889, when the temperature of the three days, 7th, 8th, and 9th, was 78°, 85°, 88°.

On last Saturday, the 11th, the oppression of the air was almost unbearable, and towards 6 P. M. the inevitable thunderstorm burst over the town with a copious rain, which, with slight intermissions, lasted till noon on Sunday. Lucky are they who have all their grain sown: there cannot well help being a good crop on all well-farmed land.

FARM-WORK FOR JUNE.

Grain-crops.—As usual, there will probably be some grain still to sow on the heavy lands. Remember that, when put in so late, the young *braird* will have no time to tiller, and so allow an extra quantity of seed to the acre. Four bushels of oats to the imperial acre will not be a bit too much.

Roll the grain that has had grass-seeds sown among it. All grain should be rolled but especially when in this category.

If the late heavy rains have jammed down the land where the grain is up, do not be afraid to pass the harrows over it. It will break up the crust that the succeeding hot sun is sure to form and prevent scalding.

Green-meat.—Those who have been wise enough to sow a piece of lucerne on land suited to it—a dry subsoil—

will have had some fit to cut long before the first of the month. Keep it cut, for like Hungarian grass, it soon becomes too stick-like to be relished by stock. By the 8th of the month the red-clover will probably be ready for cutting, to be succeeded by the second crop of lucerno, the vetches etc., and thence forward there will be always something or other to bring into the yards at night.

Early sown rape should be fit for the sheep by the end of the month, and if a mixture of rape and vetches has been got in by the 1st May, there will be plenty of food for ewe and lamb.

Sheep.—If any sign of scour is seen take care to clip the wool off the parts surrounding the fundament. When shorn, dip your sheep at once. "Lawes' sheep dip" is the best, but there are several very good ones. Look out for "the fly" in bush-pastures.

Cows and calves.—In chilly, raw weather, do not hesitate to keep your cows in at night. You can easily make up a mash of some sort for their supper. Two pounds or so of cottonseed-cake will do them good, as it is an astringent food and when the grass is too scouring from successive rains will prevent it from making the bowel too loose.

If possible, change your cattle from one pasture to another at least once a fortnight.

Pastures.—It pays to knock about the droppings of the stock in the pastures. Feed them regularly and level, though not too bare.

Hay.—By the 24th. or so of this month the red-clover should be fit to cut for hay; i. e., the majority of the heads will probably be out in bloom. Do not "wait for bulk," but let the rest go into the second crop in August. Cut, say, Monday; let the clover lie till wilted on the top; turn over with a long stick or a rake handle; let it wilt again, and then get it into cock. Carry from the cock: it is by breaking clover out of the cock that the leaf is lost.

Roots.—Early sown swedes, mangels, and sugar beets will be ready for singling by the end of the month. The two first should be deeply hoed and the earth well pulled away from the plants, as the more the bulb is left naked the bigger will the yield be. Sugar beets grow in the ground and should be rather earthed up than left bare.

Rape and Hungarian grass may be sown all through June. After the month is out rape may still be put in, but of course the crop will not be so large as if sown earlier. Six pounds an acre broadcast is enough seed, and it should be rolled in on ground previously well harrowed.

Horses.—As long as there is plenty of work to do, keep your horses in the stables and give them hard food. Before putting them out to grass, give them a little green meat, increasing it daily till the weather gets warmer. If nights are cold, do not let the work horses sleep out.

THE ADVANTAGES of a VARIETY OF CROPS.

(Continued.)

By THE EDITOR.

Tobacco.—As every Kentish farmer is so deeply interested in hop-growing that he would rather give up his business than not grow hops, so we feel sure that were we to go into harness again—which we are too old to do—we could not get on at all without an acre of tobacco. From the time the plants are set out till the final packing for market, there is always something to be done in the field or the drying-shed; and every day produces some change in the leaves that conveys a lesson or a warning.

And we do not see at all why our French-Canadian friends should monopolise, as they seem to do, the production of this crop. There is plenty of land suited to it all over the province. The sowing, cultivation, harvesting, and preparation for market are processes easily learnt; and as for the profits, hear what one of the largest growers, M. J. B. A. Richard, of Joliette, says about that feature:

"I grow from 20 to 25 arpents of tobacco a year, and last year I realised from its sale \$2,240.00. This year, I have in my drying-house about 26,000 lbs. of fine tobacco, which I expect to sell 12 cts. a pound." That is, about \$125 an acre for a crop that only remains about 12 weeks in the ground, and cannot therefore cost a great deal to cultivate.

In a rough way, we may fairly calculate the expense of an acre of tobacco from seeding to packing at from \$45.00 to \$55.00, and the perfect cultivation of the land with the residuum of the heavy dressing of manure required ensures a good, even an abundant crop of grain afterwards. For the plan too frequently followed of constantly repeating the tobacco crop year after year on the same piece of land is a very mistaken plan.

In brief, the following is the best system of growing tobacco.

SEED.—For bulk of crop—weight per acre—the Connecticut seed-leaf, used for cigar-wrappers, is the most productive. When we grew it at Joliette, some twenty-five years ago, on very poor sandy soil, manured with dung and the refuse—scraps of flesh, ashes, &c.—of the tannery, it gave us about 1,700 lbs. an imperial acre. The distance between the rows was 3 feet, and from plant to plant in the rows 2 feet. The then High Constable, M. Panneton, measured some of the leaves = 41½ inches in length.

The Havana leaf is a better sort for smoking, but the best of all is the small "tabac Canadien," a very ugly looking plant, with leaves seldom exceeding ten inches in length, and narrow, but with a flavour and richness of smoke excelling all the tobaccos we ever used except, perhaps, the Greek leaf from the Gulf of Salonica. As this kind is very small, the plants may be set very near together, say, 30 x 16 inches.

Sow, in a mild hotbed, about the last week in March; transplant into cold-frames as soon as the plants can be handled; and set out in the permanent quarters from the 10th to the 20th June. The preparation of the land is the same as if a root crop was to be sown. Fall ploughing, spring-grubbing, manure in drills, and the drills well rolled down before transplanting.

A transplanting machine is said to do good work, but its watering apparatus seems to us to be unnecessary,

and as it adds greatly to the cost as well as to the weight of the implement we should not care to use it. If the plants are well rooted, carefully taken up, and the ground pressed very firmly round them, they need no watering in the hottest weather. We have set out with our own hands so many thousand plants that we are bold to speak positively on this subject. Horse- and hand-hoe as often as possible until the leaves expand over the space between the rows. Artificial manures will doubtless assist the plant, but farmyard dung, slaughter-house and tannery waste, are the main stand-bys.

When to harvest can be better learnt by inspection than by description. Stop the top as soon as the bud shows itself. Keep the "drageons" well picked. Do not let the tobacco heat a bit before drying as that makes it smoke hot. Hang as fast as gathered. Never mix second crop leaves with those of the first crop. The manufacturer knows how to sweat the dried leaf better than the grower.

ROTATIONS OF CROPS.

(By the Editor.)

As bone-dust was used as a manure for turnips long before chemists recommended phosphoric acid, so rotations had become the custom of farmers long before the reason for their adoption was discovered.

De Candolle was, if we remember, the first to investigate this question. After a good deal of research he came to the conclusion, that every plant arriving at maturity, left behind it, on separation from the soil, a certain quantity of excrementitious matter, positively injurious to plants of the same sort, but entirely innocuous to plants of other sorts. One would have thought that the simple consideration of a meadow or pasture would have shown him the absurdity of his theory; but even now, we observe from hints dropped here and there, that the excrementitious theory is not quite exploded.

We do not imagine that the more thinking part of the agriculturists were ever deluded by De Candolle's specious doctrine. They, as it has often happened in like matters felt the real reason for an alternation of crops, rather than thought it out. They saw that wheat after wheat produced a badly nourished grain, and a weak spongy straw, and they jumped to the conclusion that the second of the two crops had not found enough to eat in the soil. Simple enough, but about the right idea, after all. There, doubtless, was enough to eat in the soil, but it was not properly cooked. Hence fallows came into vogue. Not, as it is sometimes thought to be, land "in fallow" meaning land lying idle, but land ploughed, harrowed and dragged, that new surfaces may be continually exposed to the air, and a more perfect disintegration of the mineral parts of the soil accomplished: in other words, the cooking of the dormant plant-food.

Soon however, on the lighter class of soils, it was discovered that fallowing the bare soil was not only extravagant, but injurious to the moisture retentive quality of the land. The introduction of turnips to field culture, and the demand for more mutton and wool, gave rise to the Norfolk or four course rotation, which is still, in the south of England, the system upon which almost all the best farms are cultivated. This course, or shift, or rotation—synonyms—had,

as we shall see, one vital fault; but it was an adaptable plan, and it answered its purpose of preserving the land from too much exhaustion, for many a long year. It was, as most people know, made up of two grain-crops, one root-crop, and one clover-crop, the latter mowed or fed, as the case might be.

The root-crop, wherever it was possible, was fed off by sheep, hay and other light food being given in addition. The sheep manure and the pressure of their pointed hoofs, produced the finest barley in the world, and the subsequent crop of clover, mowed generally twice for hay, yielded great wheat crops. Towards the year 1830, however, a terrible cry arose all over the east of England: the clover had failed! What was the reason? Nobody could say; the chemist had not considered the matter; the farmer could not reason much in those days, but he concluded that if clover could not grow, something else would and perfectly in accordance with the Verulamian teaching—by constant experiment, he discovered that it was necessary to avoid the too frequent repetition of this crop; and that, whereas grain crops might recur every second year without permanent injury to the soil, the clover would not bear repetition at a less interval than twelve years. Since that time, all the best practical men, both chemists and farmers, have been trying to get at the bottom of the cause of the failure; but up to this very day nobody has succeeded. Our own idea is, that it is due to some defect in the mechanical condition of the land rather to a scarcity of clover-food in a proper state of preparation; but when Sir John Lawes says, positively, that he knows nothing about it, we do not think our opinion is worth much. The Scotch improved system took a different shape to that of England: instead of a four-course, they adopted a five- or six-course; beginning with roots, grain, and letting the grass lie out for two or three years, it ended as usual with grain. Very little hay was made, whereas all the clover in the English rotation was mown for hay. The clover did not fail in Scotland—why we cannot say—but quite as great a mischance has happened: the turnips are so terribly injured by the disease called "finger and toe," that in many parts of the north, the farmers are seriously thinking of converting their five- or six-years course into one of seven or eight years, particularly on the heavier soils.

To whatever causes the practical failure of these two important crops may be due, it is clear that want of nourishment is not one. For the men of the east of England and the south of Scotland are the chief sufferers, and they are, certainly the most liberal farmers in the world; they use large amounts of purchased manures cake, &c., and nothing but meat, milk, and grain, is allowed to leave their farms. The frequent recurrence of the potato-disease will occur to many as another instance of the extremely hazardous tenure by which the prosperity of the agriculturist hangs. But we believe we have nearly arrived at the cause of this malady, and its cure is not far off. Every day new sorts of potatoes, grown from seed, are brought to light, and all have the mysterious power of resisting the rot for a few years: but, for very few, we regret to say, as the *Champion*, in a couple of years more will doubtless, go the way of all its competitors, and some other newer kind will have to take its place. We presume that wherever fallow-crops are grown in this country no one would be foolish enough to repeat the same sort on the same soil. For in-

stance: where Indian corn occurred in one shift potatoes should come in the next, where turnips, there beets or mangolds, and so on.

Every sensible man who breeds his own stock will see the necessity of adopting some fixed rotation, and thus preserving a balance between the number of his cattle and the crops designed for their support. The extent of each course must depend in great measure upon the situation of the farm. In the neighborhood of large towns, where unlimited supplies of manure can be obtained at a nominal cost, the rotation will naturally be a short one. Mr. Irving, of Logan's farm, follows the five years course; Mr. James Drummond, of Petite-Côte, extends his grass to three years. But I doubt very much if less than seven or eight years would answer the purpose of the farmers of Shesford, Compton, or Huntingdon. The small amount of manure attainable must, at first, make long rotations unavoidable everywhere, but as a farm gets well in hand, the course may be shortened with advantage both to the land, to the stock, and to the occupier. Again, where hay is saleable at a high price, the grass may lie out for a year or two longer, provided that a fair amount of manure is imported in return for the extra crops sold off the farm.

After all, the course selected must depend upon the judgment of the farmer, and this judgment will most likely be guided by the practice of the district in which the farm is situated. We do not advise any one on settling in a new neighborhood to come to the conclusion that the customs of the inhabitants are all wrong. They, very often, are founded on causes which do not show themselves to a casual observer. Still, there are certain methods of cultivation which can be set aside at first sight. For instance, as more immediately connected with our subject, the course of cropping I have met with, not many miles from St-Hyacinthe: three years in grain, followed by three years in grass. I take this to be, without exception, the very worst course in the world. There is in it no chance of cleaning the land; to say nothing of the successive recurrence of three white-straw crops. Consider the effects of the unimpeded seeding down of every weed that occupies the land, and that for ever, or at least as long as this rotation is persisted in!

Household-Matters.

Influenza.—If during the winter you have gone through influenza, (*la grippe*) you will often find yourself feeling, as if life is a great burden, and work out of the question. Still the daily routine must be gone through, meals must be got in time for the field-workers, for time waits for no man. Now when you feel as if you could do no more, do not force nature, but give up and let yourself have a rest, for there is no medicine will do you more good than dieting well. Do not fast long, but take nourishment often, do not let 3 hours pass without tempting the appetite with some kind of food: Beef-tea, or broth in the morning, an egg well beaten up in a glass of milk with a scrape of nutmeg and a little sugar to flavour it, or a cup of cocoa, is very nourishing. And here let me stop to say that, to my mind, so many people make anything but a tempting drink of this, some serve it up cold, and others make it, from

mistaken kindness, too thick. One tea-spoonful of cocoa mixed with a little milk just in a thin paste, one cup of milk and water boiling, turn in the paste and just let it boil up, serve hot with sugar to taste. Take one, or the other, of these diets and you will be the better for the rest, and nourishment, and renew work with a less desponding spirit. Now it must not be forgotten that this dreadful complaint has spared no man, and should the male portion of the family have been attacked, it goes without saying, they too might suffer from weakness, and despondency.

Pity the poor man, who feels so, and still has to keep pace behind a couple of spirited horses, dreading at every turn that he may have made a crooked furrow. This man ought to take a rest, and having brought a slight refreshment, sit a bit and let nature have time to nourish him a little before renewing the conflict. The horses won't object and will be all the better for it. A few seasoned sandwiches, a little more tempting to a delicate appetite, and a food must be taken in this shape in the fields, unless the work was near home, then decidedly try beef-tea, or broth a little tea, or milk.

Two slices of thin bread and butter. One hard boiled egg cut up in thin slices and put between two pieces of bread, with a very little pepper and salt, cut up into pieces about 4 inches long by 3 wide.

A little chopped ham, cold meat of any kind, just for a change, a leaf of salad, in fact anything to tempt the appetite. I never laughed more in my life than over the description given by a young man, as to his boarding-house sandwiches, and his friends' home made ones. He took up a dessert plate and holding it in two hands, made several attempts to bite a piece but only succeeded in pulling an imaginary string of tough meat out, saying: "this is how poor Willie is treated," and all the time my friend is feeding away at his dainty little bits without any fear of stringy meat inside. Well; anything worth doing is worth doing well or in some cases had better be left undone.

Work for the girls.—I read of a few young girls in the States who have made money, by cultivating, and selling flowers. A very pleasant and healthy occupation and one that any girl might follow, but to do so there must be a place where the sales are certain, and quick, not too far from home, or the losses might be too great to leave any profit. Now, this might induce other girls, on a farm, to see what they can do in the way of making a little pocket money, for it certainly is very nice to earn a few dollars, and to feel that they are yours to do what you like with.

Why do so many farmers daughters come to town and take situations? Not for love of work, but for the money she will get for the same, and the pleasure of spending it.

Far better would it be for some of them, if they would content themselves, with the healthy farm life, and try what they can make there rather than having to work in a hot kitchen during the summer, while their own home in the country is open to them, to choose many little ways making a little money, and give a little help to the often over-worked mother at home.

Why not try raising chickens? It is not hard work, and with care would pay well, for unlike flowers, your chickens would not fade if you could not sell them all the same day, but

would increase in value the longer you keep them. It seems superfluous, my saying anything about hatching, or the care of chickens, as an article (1) is given, in the Journal, every month about poultry, and the back numbers will tell how to get on from the starting point. In Europe they are talking of starting schools for teaching young people the art of poultry-farming.

If the young people would turn their minds to market gardening, they would find money in it. A little study of the matter would soon convince them that it is not difficult, but decidedly profitable to grow, lettuces, onions, pease, French beans, beet-root, carrots, and many others, but for my choice I should decidedly choose lettuces, pease, and French beans, and this work is just suitable to young people, as the greater part of the work is hard for elderly people, the constant stooping to gather the harvest; but when the young people have once sold a few bushels of pease or beans and felt the dollars in return, I do not think they would think twice about the labour. In back numbers of the Journal you can find the way to do all these things, and many more.

Poultry keeping abroad.—An interesting State paper has just been published containing reports from Her Majesty's representatives on the Organisation of Departments of Agriculture in Foreign Countries. The *motif* for these reports was a letter addressed by Lord Roseberry, dated October 14th, 1893, to the British Ambassadors at Vienna, Brussels, Copenhagen, Paris, Berlin, the Hague, Rome, Stockholm, Berne, and Washington, at the instigation of the Royal Commission on Agriculture. Article 4 of this letter asks for particulars as to "the encouragement of dairy and poultry farming, fruit culture, market gardening, and forestry." It is a satisfaction to see that in this inquiry poultry has not been neglected, and below is a summary of the references on this subject which however, might, with advantage, have been fuller.

AUSTRO-HUNGARY.—In his report Sir E. Mondon says that in Austria "the importance of poultry farming has not been forgotten by the Ministry of Agriculture, and subventions are granted to the societies founded for the improvement of the breed of fowls," and, further, that "the Hungarian Ministry also encourages poultry farming in every way, and supports a publication issued by the Association for Poultry Breeding, which is distributed gratis to elementary school teachers."

BELGIUM.—Technical education evidently regarded as an important factor in the advancement of agriculture, and in several directions remarkable advance has been made. Sir F. Plunkett reports that "State encouragement of dairy and poultry farming, fruit culture, market gardening, and forestry takes the form almost exclusively of the instruction in these branches afforded by the State educational establishments. A proposal was made some years since for the State encouragement of poultry rearing and market gardening, especially with a view to the development of a trade with England, but came to nothing. At the present moment steps are being taken by the State to assist the formation of a society for the improvement of poultry rearing; but the matter is as yet quite in its infancy. After the expiration of a year the society is to report progress to the Government, when the

latter will decide as to the form of encouragement they consider most suitable."

FRANCE.—The Marquis of Dufferin sends a most valuable memorandum, supplied by Mons. Tisserand, Director of the Ministry of Agriculture, from which we learn that the French Government is more awake to the subject than that of any other country, and it is very instructive reading. In the 3rd Degree of Teaching there is a practical school of aviculture (mis-spelled in the report agriculture), and of this the following particulars are given: "For the rearing of poultry special encouragements are given at the expense of Treasury; farmyard animals receive numerous rewards at all the competitions. A special school of aviculture has been organised in the Houdan country, at Gambais near Paris, to teach what are the best breeds, and the improved methods of rearing and fattening poultry. Boys and girls are received into this school. The course of lectures last three months. The State keeps eight young people there at the cost of the Treasury. Board, comprising maintenance and instruction, costs 350 fr. for the whole duration of the course of lectures (three months)."

Physical Splendor of Modern Youth.

—As I have no longer youth, I must be content with memory and experience, and I do not hesitate to say that when I look back upon the young men and women of forty and thirty years ago, I am amazed rather at the physical splendor and dashing energy of our young friends of to-day. The world seems to have filled with Apollos and Dianas; cheap food and clothing, improved sanitation, athletics which bring temperance with them, frequent changes of air and scene, and a more scientific regulation of all habits, seems since my adolescence to have transformed middle-class youth; and the change is rapidly spreading downward.

Women especially seem to be changed for the better. Freedom to live their own lives, and the enfranchisement of their faculties in a liberal education, which, physically put, means the development of their brains and nerves, so far from making women more whimsical or languorous, seem not only to have given them new charms and fresher and wider interests in life, but also to have promoted in them a more rapid and continuous flow of nervous spirits, and to have warmed and animated them with a new vitality both of body and mind.—[Dr. Allbutt, in Contemporary Review.]

Thackeray's Tribute to Woman.

—A good woman is the loveliest flower that blooms under Heaven; and we look with love and wonder upon its silent grace, its pure fragrance, its delicate bloom of beauty. Sweet and beautiful! The fairest and the most spotless! Is it not a pity to see them bowed down, or devoured by grief inexorable, wasting in disease, pining with long pain, or cut off suddenly in their prime? We may deserve grief, but why should woman be unhappy? Except that we know that Heaven chastens those whom it loves best; being pleased, by repeated trials, to make their pure spirits more pure.—

With our children.—Teething children may be relieved of convulsions by being immersed in a warm bath with cold cloths on their heads.

The education of delicate, nervous children may be neglected until the

age of six or seven without danger of duncthood.

Bear in mind that you are largely responsible for your child's inherited character, and have patience with faults and failings.

The practice of frightening little children in order to make them quiet, has, in some cases, resulted in convulsions and death.

If the children want pets, pray indulge them, but insist upon their taking sole charge of them as well as giving them the best of care.

Those who teach young children should speak to them properly, not hisping or using silly words, for they can understand sense better than nonsense.—Good Housekeeping.

Manures.

MANURIAL EXPERIMENTS IN SCOTLAND.

In experiments with different kinds of turnips, including several varieties of swedes and yellow turnips, the greatest average crop of roots on five farms, 26 tons 15 cwt. per acre, was obtained with the use of 6 cwt. of superphosphate, 1 cwt. of nitrate of soda, and 1 cwt. of sulphate of potash. If tops be included, the greatest yield was obtained with the use of 20 tons per acre of farmyard manure, but at more than double the cost of any of the chemical manures, and more than three times the cost of any mixture but one. There is no financial reckoning for the experiments as a whole; but, if the whole cost of the manure be charged to the turnip crop, the dressing which gave the best results in money value in proportion to costs was 6 cwt. of superphosphate alone. But the dressing named above as having given the greatest crop of roots was practically equal in pecuniary results, putting the roots at 10s. a ton, and not reckoning tops, in which the superphosphate had the advantage. There is a table calculating money profit for the trial on one farm, and in this case only half the cost of the farmyard manure is charged to the turnip crop, and, thus reckoned, the greatest profit is shown on the plot dressed with 10 tons of farmyard manure, 3 cwt. of superphosphate, and $\frac{1}{2}$ cwt. of nitrate of soda. The principal conclusions drawn are to the effect that all the phosphatic manures applied gave an increase, and paid; that the phosphate was most effective and profitable in the form of superphosphate, except, perhaps, on peaty soils, where basic slag was at least equally effective; that basic slag with nitrate of soda, gave better results than bone-meal containing equal quantities of phosphoric acid and nitrogen; that the addition of sulphate of potash to artificial turnip manures pays; that the best manure, when artificials only are used, is a mixture consisting mainly of phosphates, supplemented with moderate quantities of nitrogenous and potassic manures, as in the mixture mentioned above as having produced the greatest weight of roots; and that while large crops can be grown with farmyard manure alone, better and more profitable results can be obtained by a half-dressing of that manure, and additions of small quantities of phosphatic and nitrogenous manure, as in the case of a plot dressed with 10 tons of farmyard manure, 3 cwt. of superphosphate, and $\frac{1}{2}$ cwt. of nitrate of soda. (?) We are bound to point out,

(1) This used to be the almost invariable practice in England in 1850.—Ed.

however, that, reckoning tops and roots together, the greatest weight on the average where no farmyard manure was given was obtained from the use of 6 cwt. of superphosphate (28 per cent. soluble) alone, and the most profitable result in proportion to cost of any dressing.

For oats on ten farms of different varieties of soil the best average yield of corn, 2,131 lb. per acre, was obtained with the use of 2 cwt. of superphosphate and 84 lb. of sulphate of ammonia, but in this case the weight of straw was 3,956 lb., a quantity much exceeded on a plot dressed with 2 cwt. of superphosphate and 1 cwt. of nitrate of soda, which yielded 2,107 lb. of grain and 4,311 lb. of straw. The most important conclusions derived by Professor Wright from these experiments on oats are that nitrate of soda alone gave a very profitable return on soils in good condition, but an uncertain one on other soils, that this manure, with superphosphate, gives a more certain and profitable return than when used alone, that nitrate of soda proved somewhat more effective than sulphate of ammonia (it was a dry season, we may point out); and that the addition of potash to mixed nitrogenous and phosphatic manures is attended with marked advantage on *lea* oats, but not on oats grown after roots which received an ordinary dressing (1) of farm-yard manure. There is so much that is valuable in the report of these well-managed experiments that we deem it desirable to inform our readers that the pamphlet can be obtained post free for a shilling from the Secretary of the Agricultural Division of the Glasgow College, Mr. John Young, 38, Bath Street, Glasgow.

REMARKS ON RECENT AGRICULTURAL EXPERIMENTS.

Some of the experiments recently reported are upon the influence of manures on grass land. In these experiments it seems to be generally the practice to weigh only the first cutting, no account being taken of the after-growth. Probably the after-growth is fed off by sheep; but with small plots it must be practically impossible to ensure that the crop of each plot is returned to its own soil as sheep manure. Even, therefore, if the trial of the same manure is continued on the same plot for several years, the result is marred, and does not accurately represent the effect of the manure. Dr. Somerville is apparently quite aware of the error thus introduced; for while all his North-umberland grass plots, save one, show a money loss on the hay crop, he adds, "I have not a doubt in my own mind that the increased value of the after-math alone has been sufficient to clear off the debit balance from every plot except Nos 4 and 6." The weighing of the after-math is thus clearly necessary if the economical results of the manures are to be ascertained.

In some of the experiments on meadow land it is proposed to trace the effect of a single dressing of manure during five years. It may well be doubted whether it is worth while to spend five years in ascertaining the effect of a single application of 2 cwt. of common salt, or 2 cwt. of nitrate of soda per acre; the natural difference between the different plots may, in fact, easily exceed the differences produced by such small residues. My chief object, however, in calling attention to this mode of experiment is to

(1) i. e. oats after grass.—Ed.

speak of a fallacy, frequently unperceived, which attends the results and the conclusions drawn from experiments of this class. Supposing a meadow to be divided into plots, one of which receives a full dressing of nitrate of soda, while others receive basic slag, kainite, and other mineral manures, the result in the first year is generally a large and profitable increase from the nitrate, and a small increase from the mineral manures. The next year, when no manures are applied, the plots which had received the slag and kainite continue to yield a larger crop than the unmanured land, but the plot which had received the nitrate is in a sorry condition; the quality of the herbage is probably worse than where no manure has been applied, and the quantity of the crop is perhaps also below that without manure. The conclusion at once drawn is that nitrate of soda is a mere stimulant, and (notwithstanding its profitable return in the first year) a very unsafe manure to apply to grass.

In all manuring experiments with meadow or pasture we have to bear in mind that the action of manures on the mixed herbage of grass land is a very complex one, every manure, indeed tends to develop the plants most suited to the condition which that manure supplies. When nitrate of soda is applied the herbage most suitable to this manuring is strongly developed, the plants not thus favourably affected being at the same time weakened, and, if the treatment is continued, destroyed. If now the supply of nitrate is suddenly stopped, the agreement established between the herbage and the manure is upset. The few strong grasses which gave an abundant crop under the influence of the nitrate have got possession of the land, but their special supply of food having ceased, they are capable of little growth, and it will take a long time for the more delicate herbage to re-establish itself. In all successful treatment of grass land we must aim at preserving a general continuity of condition if the best results are to be attained. A first-class pasture must never be mown for hay. (1) A meadow may be profitable, whether dry or irrigated, but the system must not be mixed if excellence is desired in either state. The plan of testing the value of manures for grass land by measuring their effect after their immediate application has ceased, is thus not one of general applicability. It can succeed only in the case of manures, such as lime or phosphatic slag, of which large quantities can be put on in a single application, and from which large residues remain on the land to preserve in subsequent years the continuity of the new conditions which the application of these manures has established.

COMPLETE MANURES.

The term "complete manure" is used to name such combination of fertilizing materials as will supply all the elements necessary to normal plant growth. As the principle ingredients needed to support fertility in ordinary farming operations are practically limited to nitrogen, potash and phosphoric acid, a manure containing these three may be understood to be in fact, a complete manure. The simple fact that a manure contains these elements is not enough; it must contain them in certain definite proportions. A manure may con-

(1) An invariable rule in England.—Ed.

tain sufficient nitrogen, for example, to produce a yield of 30 bushels of wheat per acre; sufficient phosphoric acid for 25 bushels, and potash for 20 bushels only. Such manure will have an agricultural efficiency of 20 bushels, and the excess of nitrogen and phosphoric acid will, so far as that particular crop is concerned, be wholly useless. Not only useless but largely lost as unless the catch crop method is practiced, the fertilizing elements not assimilated either take unavailable forms or are dissipated by drainage and other causes. Even catch crops are but slightly efficacious; the soil, already exhausted of available potash by the wheat, is unable to supply materials needed and though the catch crop may require relatively less potash than the wheat, this difference between crops is so small that little economy is possible.

The lesson indicated is,—The crop producing value of a manure is measured by its lowest fertilizing ingredient. It is true that some soils contain naturally varying stores of plant food in an available form. It is also true that these stores are rarely or never balanced economically. If such supplies were easily measurable, a fertilizer could well be compounded to profit from same, but stores of plant food are subject to constant change and dissipation; a method of culture giving results one season, may prove disastrous the season next following.

It must be understood that these remarks apply more particularly to the farms of the North and East, which have been so systematically exhausted by diversified cropping, that the elements of plant food in an available form are almost uniformly deficient. In the West and parts of the South, cropping has been as yet less searching either through a lessened period under cultivation or absence of a wide diversification of crops grown. In this latter territory, instances are frequent in which incomplete manures have been used for many years with some success, but the principle remains the same; the plant must have the chief elements of fertility in certain proportions, in a particular time, and in an available form. By trusting to chance in these proportions, the average of agricultural production has been brought to a very low ebb indeed.

The farms of the East and North have been practically exhausted of their natural supplies of plant food in such form as to have a specific crop-producing value. The constant use of farm-made manures has contributed no little to this exhaustion. The nitrogen of manures is always supplemented by nitrifying organisms in the soil, nitrates in rain water, and other sources; farm made manures usually contain an excess of nitrogen, as compared with the other elements, the formula (under actual growing conditions) in fertilizer language is practically as follows:

Ammonia.....	10
Potash.....	6
Phosphoric acid.....	3

With many staple crops, this is not a properly balanced manure. The proportions for wheat are,—Ammonia, 10; potash, 4; and phosphoric acid, 3. The minerals are deficient as compared with the manure, but the discrepancy is not on the wrong side. With corn, however, the conditions are very different: the proportions become ammonia, 10; potash, 10; phosphoric acid, 4. Taking into consideration the quantity of ammonia obtainable from other sources than the manure itself, this crop seems fairly well adapted

for home-made manures. But how is it with potatoes? The proportion in this case is,—Ammonia, 10; potash, 14; phosphoric acid, 5. The potash is deficient. Clover is one of the most important crops to the farm; rather, the most important one. The proportions for clover are,—Potash, 17; phosphoric acid, 5. Clover being a leguminous plant, accumulates a larger part of its nitrogen from the atmosphere. By the continued use of farm manures the natural supplies of soil minerals have been exhausted. (1)

It is well understood that farm-manures contain an excess of nitrogen, relatively. Grain lodges badly by its continued use without added potash and phosphate. Potatoes produce a diminished crop, or go to vines and produce little or nothing; on every hand are evidences of deficient minerals, particularly in the case of potash.

It follows that the farmers of the North and East should pay especial attention to the minerals in their manures. Potash is the weak point almost invariably, and measures the crop possibilities,—fixes the limit of production so to speak. Incorporate potash with the home made manures, and also a small portion of phosphate, and the full value of the manure may be obtained; otherwise, the greater proportion of the expensive ammonia must surely suffer loss. P.

GOOD CROPS GROWN AT A LOSS.

A striking illustration of the fact that even the heaviest crops of cereals will not prevent the farmer from being a heavy loser is afforded by the books of a large South Kent agriculturist balanced up to December 31st last. The gentleman was singularly fortunate last year in the quantity and quality of everything he grew, as the following figures will show. His wheat averaged as much as six quarters to the acre; his barley to seven quarters; his oats to ten-and-a-half quarters; and his hops to 16 cwt. He has sold out his entire produce in cereals and hops, and the amount realized comes in round figures to only £1,800. On the other side he has paid for labour and artificial manures to get these crops rather over £2,000. And to this amount must be added rent of land, interest of capital and a large percentage for incidentals, besides the value of his own supervision. Truly farming in these times is a heart-breaking pursuit.

Kent (Eng.) paper.

ARTIFICIAL MANURE FOR GRASS LAND.

So far as mineral manures are concerned, we can say that the earlier they are applied to grass land the more likely they are to produce the desired effect. The question is often asked, "When should basic cinder, superphosphate of lime, or potash salts be applied to grass land?" and our usual reply is, "As soon as possible after New Year's Day." (2)

To apply such manures earlier, as, for example, in the autumn, might be defended as equally good practice, but there is no need to incur expense months before it is needed! Most mineral manures require plenty of rain to

wash them in the ground, and one of the most common mistakes is to apply them in March, when the winter's rain has fallen, and when there is always the risk of a dry spring. It is therefore an advantage to apply them at a time when they will receive the heavy rains of February. Manures such as superphosphate, basic slag, kainit, or of an offensive character, such as fish meals or soot, ought to be applied early in the year, so as to secure their being washed completely down from the leaves and stems of the grasses into the soil. Correspondents sometimes ask if any harm to live stock is likely to follow top-dressings on pastures? It is certainly possible, for if animals graze on herbage which carries a perceptible quantity of lime, slag, or superphosphate upon its surface, the peril must be considerable. All this is avoided by applying such fertilisers several weeks before cattle are turned out, and at a period when hard rain or melting snow is sure to carry away all the particles of manure to the soil.

BASIC CINDER.

This substance cannot be better applied than in January. It is a waste product of steel manufacture; and is produced in the abstraction of phosphorus from pig iron in a state of fusion by means of a dolomite (basic) lining to the converter. The product is basic cinder, which was early found to be of great manurial value. Many suggestions were at first offered for increasing its usefulness, but finally it was found best to simply grind it as finely as possible, abstracting any pieces of iron by means of magnets, and it is by these methods that Thomas's phosphate powder is formed. Its composition is at once seen to be promising, for it contains from 14 to 17, and occasionally 20, per cent. of phosphoric acid. A partial analysis, supplied by Dr. Aikman, runs as follows:—

	Per Cent
*Phosphoric acid.....	17
Lime in combination with phosphoric, silicic, sulphuric, and carbonic acids.....	40
Free lime.....	15
Oxides of iron.....	12
*Equal to tricalcic phosphate (37).	

The presence of iron oxides alone would be prejudicial in any attempt to change basic cinder into superphosphate, as the iron oxides would be certain to cause the soluble phosphates to revert. The fact that the phosphate of lime exists in the form of tetra-basic phosphate, instead of in the usual tribasic form, renders it less stable, or more immediately available for vegetation. This is well shown by the immediate effect of basic cinder, even when applied to the root crop, for if it were not quickly rendered soluble but little benefit could follow in this case.

Applications to grass land need not necessarily be so rapid in their action as those used for turnips and swedes, which accomplish their growth in a period of from twelve to twenty weeks. Hence, as a permanent improvement to grass land, a dressing of 6 to 10 cwt. per acre of basic cinder is invaluable. There is no danger of the fertilising ingredient being lost, for most soils will retain phosphoric acid without allowing it to wash through. Thus a liberal dressing of this substance may be looked upon as giving a large addition of phosphoric acid to a pasture, the substance in which such

land is probably most deficient through the constant loss of phosphates to which it is subjected in dairying and through the growth of young stock. It has been found that basic cinder produces the greatest effect on soils containing an excess of vegetable matter such as peat, and this again points it out as particularly suitable to pastures. Also on clay soils poor in lime it is found beneficial. There are, no doubt, soils of a light dry character on which dressings of this substance have proved disappointing. On the other hand, we know of many poor clay pastures which have through its use been doubled in value. It produces a marked effect on clover, and induces a thick undergrowth of all the natural leguminous herbage of pasture. If a dressing of basic cinder in January is followed about 1 cwt. per acre of nitrate of soda in March, a heavy crop may reasonably be expected in a fair season. This is better than mixing the two manures together and applying them later, because the extreme solubility of nitrate of soda is inconsistent with the time required for basic cinder to find its way to the section where the roots feed. It is true that in root cultivation the two may be mixed, but the conditions are widely different between a tillage field and a pasture. On no account should sulphate of ammonia be mixed with basic cinder, because of the large quantity of free lime contained in the cinder and the basic reaction, which frees ammonia, and allows of its volatilisation into the air.

POTASH SALTS.

The known effects of potash salts upon clovers and other leguminous plants shows the importance of these manures for grass land. They may be added to basic cinder with excellent results.

The most familiar form of potash salts is kainit, a natural salt, found in mines in Anhalt-Deessau and the district around Stassfurt. It contains about 24 per cent. of sulphate of potash, equal to 12 per cent. of pure potash, and about 27 per cent. of sulphate and chloride of magnesium, with 31 per cent. of common salt. Thus kainit combines the advantage of a dressing of potash and common salt. Among other sources of potash may be mentioned sulphates of potash and magnesia, imported from Germany, and containing 51.8 per cent. of sulphate of potash, also muriate of potash. This is a very concentrated manure, and is usually sold on a basis of 80 per cent. purity. There are also calcined potash salts, containing over 60 per cent. of muriate of potash, and lastly there is nitrate of potash, which, although highly valuable as a fertiliser, is too expensive for ordinary use. The list of potassic manures is therefore considerable, and ample for practical purposes. It may be observed that, owing to the large supplies of farmyard manure employed in agriculture, and the excess of potash in straw, it is often found that further additions of potash are not needed. As a dressing for grass land, in combination with basic cinder, it will be found beneficial in many cases, and a dressing of 4 cwt. of basic cinder and 2 cwt. of kainit might be applied at the present time with every prospect of success.

THE GOOD OLD PLAN

of applying bulky dressings of earth, road scrapings, and dirt of all kinds to grass land should never be lost sight of. Few dressings will

produce more permanent results than a coat of compost, of such rough materials as above mentioned, on grass land. They are, in truth, chemical in their nature, and contain potash and phosphates, besides a fair proportion of organic matter containing nitrogen. If it is an objection to such bulky dressings that the labour of application is expensive, it may be urged on the other side that in frosty weather, and other idle periods, the horses must be employed or left idle. They cost nothing, and must be got out of the way; and no better use can be made of them than to cart them on to bare hill sides and other poverty-stricken places. These bulky materials also increase the thickness of the soil, and prevent it from burning in the height of summer; they help to retain moisture, and increase the feeding-ground of root fibres.

"CAKING."

Among the ordinary methods of improving grass-lands few are better than manuring through animals. The cost is small when the cattle part, and increases with the always possible loss through falling prices. The landlord or farmer who means to improve his pastures and meadows will probably adopt all the methods above indicated, and he may go further and commence operations by laying down a system of drainage with a view to improving the percolative system of his soils. This he will follow up by a dressing of basic cinder and other fertilisers, as well as by applications of earth and composts, and again by liberal feeding of stock with cake and corn. Such efforts, if directed with judgment, must result in a great increase of productiveness and of rental value.

JOHN WRIGHTSON.

ARTIFICIAL MANURE.

At a recent meeting of the Kingscote Agricultural Association, Mr. H. A. Howman, Principal of the Gloucester County Dairy School, read a paper on "Can farming be made more profitable by the use of artificial manures?" Having gone in detail into the constituents, prices, and effects of artificial manures, Mr. Howman remarked:—Valuable as farmyard manure undoubtedly is when properly made, and from animals that are being fed on concentrated food, what, perhaps, is a matter of surprise is that, important as it is thought, so little care should be taken in its manufacture and preservation. Farmyard manure has two functions to perform—(1) to provide the food of plants in a form that is most suitable for absorption by them, and (2) it acts mechanically on the soil. It keeps the soil in a more open condition, admitting air, and making the soil work, and it provides the vegetable matter which is so important an element in keeping land in condition and enabling it to retain moisture. In this way the indirect value of farmyard manure is probably greater than the manurial value. But if we judge of it by the standard set up supplying the requirement of plants in nitrogen, phosphate of lime, and potash, we find it is deficient in these particulars, as it only contains them in very small quantities, and they are not present in the proportion in which plants require them. It is true that farmyard manure lasts for a long time in the soil, and adds to its condition, because of this fact—it is so slowly soluble. But in these days,

(1) Herein we do not by any means agree with the writer. It is an utter absurdity as practice proves.—Ed.

(2) Refers, of course, to the climate of England.—Ed.

when the necessity presses upon farmers to get as quick a return out of the soil as can possibly be got out of it, there is something else to consider besides storing up fertility that will only come into profitable use after some years, you want to have that fertility immediately available for use by the crops, and the Rothamsted experiments have shown that it is highly doubtful whether even the soil benefits to anything like a commensurate extent by the application of large quantities of farmyard manure, taking into consideration its cost if a farmer had to buy it, and also the cost of making and carting it, and often damage that is done to the land by carting it on at unseasonable times. Farmyard manure supplies the land with vegetable matter that artificial manures are unable to do, it also probably supplies to the land fresh supplies of those micro-organisms that are now known to have such an enormous effect in converting inert materials into forms fit for plant food. But the vegetable matter may be more economically provided by the growing of green crops for ploughing in, and in respect of light land it undoubtedly is so. As regards the quantities and value of the fertilising ingredients, the Rothamsted experiments have shown that, while it restored the mineral ingredients, it was inadequate as a sufficient source of nitrogen, and its nitrogen was not half so valuable as it is in sulphate of ammonia. Much of the nitrogen only becomes very slowly available, and not a little of it perhaps takes years to be converted. It is almost universally thought by farmers that if they have manured a crop with farmyard manure there is no need to give it a top-dressing of nitrate of soda, but, as a matter of fact, at no time does it pay so well to add nitrate as a top-dressing. The farmyard will supply the mineral matters, but it is deficient in nitrogen; therefore it pays to supply it. The conclusion of the whole matter seems to be that the farmyard and artificials should be used together. The farmyard does not supply sufficient manurial ingredients to produce the largest crops without the aid of artificials. On the other hand, artificials cannot supply the vegetable matter which acts so beneficially and mechanically in the shape of straw. Learn what are the dominant requirements that the crops you grow require, then buy the manures which will contain them, valuing the contents according to the table, so you can buy in the cheapest market, and after all see that you get what you buy. That nowadays is no difficulty under the "Fertilisers Act." There is one further point that I should very much like to have brought up for discussion, and that is whether the use of these fertilisers will pay for their use, in the increased crops that they will produce, but in the present state of the wheat market it is very difficult to convince oneself that wheat can be grown at all at a profit, except to consume at home with stock. Sir John Lawes calculated that 1 lb. of nitrogen would produce 5 lb. of wheat. If, therefore, you use 1 cwt. of nitrate of soda per acre, which would give about 19 lb. of nitrogen for use, the increase should be 95 lb. of wheat, or 1½ bushels, at 2s. 6d. per bushel, the present price, would only return 3s. 9d. for an expenditure of 10s., the cost of the cwt. of nitrate. There would also be an increase in straw, but this would not make up the difference in price. As nitrogen is so high in price per unit, it is necessary to encourage the production of nitrogen in cheaper ways, and one is to encourage

the growth of the clovers by giving them the cheaper manures of phosphate of lime and kainit, and thus providing a natural source of nitrogen for the wheat which would follow. If we give the clover 4 cwt. of basic slag or mineral superphosphate at 2s. 2d a cwt., making 8s. 8d., and 4 cwt. of kainit at 2s. 4d. a cwt., making 9s. 4d., or together 18s. an acre, and if clover hay is worth £2 a ton, then it would take an increased crop of 9 cwt. to pay for this outlay in the first year, and if the clover is left down for two or three years, so as to get the full return out of the manure, then the cost of 18s. would be spread over the three years, and the result would be satisfactory. I mention basic slag because that is the cheapest form of phosphate of lime, but I must warn you that basic slag does not suit all soils, chiefly on heavy wet soils, with a large quantity of vegetable matter in them, it shows the best results, on light, dry soils it is money thrown away, and before using it you must try a small quantity first, and wait until the second year before coming to any conclusion about it.

FLAT OR RIDGE SYSTEM.

The same correspondent asks whether the flat or ridge system is better adapted for the liquid manure drill, and to this important question we are disposed to answer that the flat system of sowing is the best for this purpose. The ridge system is not, in fact, suitable for the Midland and Southern counties, (1) because the corrugated form of land so treated is liable to produce a dry condition of soil. It is also evident that as turnips are sown later as we travel southwards, they are more exposed in their young stage to the full glare of the sun, and are in more danger of injury from this cause than if sown in April and May. (2)

GRASSES

(By the Editor.)

We do not suppose that the better class of farmers in this province are likely to alter their plan of cultivating grasses. So many fine crops of hay are cut every year, composed principally of timothy, and the custom of the country of trusting to that plant has obtained for such a length of time, that the prejudice in favor of it is probably ineradicable. But, in spite of the practice being almost universal, we must be allowed to say that there are many other grasses which are just as valuable for hay; and, inasmuch as they produce a far greater amount of aftermath, are much more profitable to the farmer; it being notorious that timothy should never be grazed, if its retention as a hay-bearing crop be desired for a succession of years.

It has been already explained, in this journal, that certain grasses find themselves more at home on certain soils than do others; and that, in consequence, if a grass finds itself in a situation where food and exposure suitable to its tastes are provided, it will set all its wits to work to drive out its less happily situated neighbours, and in the end, will reign in its little kingdom without a rival.

Now, among the first requisites for a comfortable home demanded by

(1) Of England. In this hot climate, we have always held that all roots, except mangels perhaps, should be sown on the flat. Ed.

(2) In Kent, Surrey, &c., if turnips or swedes are sown before the 10th June, they almost invariably mildew.—Ed.

gramineous plants is, that the geological formation shall be congenial to their habits. In this part of the world the underlying rocks have been, almost invariably, covered up by accumulations resulting from the operations of rivers; these are called *alluvial deposits*. We see how streams and rivers cut out for themselves, channels, glens, and valleys, and transport the eroded materials, in the state of mud, sand, and gravel, to some lower level: the sand and gravel, being the heaviest, are deposited first, the clay remaining longer in suspension only leaves its bearer when the water becomes tranquil; and this may be seen all along the valleys of our rivers by any one who chooses to look. These operations have been going on ever since the land received its present configuration; and thus we have accumulations, often of considerable thickness, which consist of alluvial silt, masses of gravel and shingle, with occasional beds of fine blue unctuous clay, and layers of peat moss. (1)

Our farms lie principally on these alluvial deposits. The subjacent rock affects them but little, except where the two, on the slope of the hills, meet and modify each other, as at Saint-Hilaire, Rougemont, Abbotsford, &c. I take it, our best plan would be to consider what grasses are best suited to these accumulations, without troubling ourselves with the rarer cases in which the Silurian, or the primitive rocks, may come to the surface. And, for convenience, these beds may be divided into the four following classes: rich loams; poor stiff clays on a clay subsoil; light soils on sand; together with a not uncommon case, light sandy loam on clay. We propose to lay down a field in grass on each of these divisions, to lie out four or five years, or permanently.

1. Rich loams

	lb. oz.
Pacey's Perennial rye grass (2) ..	10 0
Smooth meadow grass.....	2 0
Cocksfoot (Orchard) "	5 0
Meadow fescue	3 0
Hard "	3 0
Meadow foxtail	2 0
Timothy	3 0
Red clover.....	4 0
White clover.....	3 0
Cow-grass (Perennial red clover)	4 0

2. Stiff soils on clay.

	lb. oz.
Pacey's Perennial rye grass.....	12 0
Smooth meadow grass.....	3 0
Rough meadow grass.....	2 0
Lolium fescue.....	2 0
Hard fescue.....	2 0
Timothy	2 0
Cocksfoot (Orchard grass).....	6 0
Red clover.....	4 0
White clover	3 0
Cow-grass	5 0

3. Light soils on sand.

	lb. oz.
Pacey's Perennial rye grass.....	14 0
Smooth meadow grass.....	3 0
Hard fescue	3 0
Soft oat grass.....	1 0
Sweet vernal.....	0 8
Cow-grass (Perennial red c; <i>Trifolium pratense</i>)	6 0
White clover.....	5 0
Birdsfoot clover (<i>Lotus corniculatus</i>)	0 8
Yarrow.....	0 8
Sheep's parsley (<i>Petroselinum Sativum</i>).....	1 0

(1) Chambly will afford a good instance of this to an observer. Above the *Canon*, sand and gravel; at the *Bassin*, dark blue unctuous clay, and in the *Savanne*, a thick bed of peat.

(2) If this is a permanent grass in Denmark, why not here?—Ed.

In number 4, light loam on clay, I should be inclined to sow nearly the same seeds as in number 3, timothy never holding out on such soils, and very often not taking at all; I should take off two pounds of the rye grass and substitute the same weight of Alsike clover, and wherever the land in any of the classes had borne red clover lately, I should sow Alsike in its place. I believe all these grasses will last as long as they are fairly treated, that is to say, as long as they are not allowed to seed down, and as long as the land is kept in fair heart. They are called, most of them, *perennial*, i. e. everlasting; but if they seed they will probably die off.

The meadow foxtail does not come to its best for the first three years, so where the land is to be broken up soon it may be omitted and a little more cow-grass or orchard grass sown in its place.

I hope it will be well understood that if the rye grass is allowed to ripen, or even form, its seed before being cut, the land will be as much exhausted as by growing half a crop of grain. If cut in blossom, no injury will be done to the productive power of the soil. The cow-grass, a most valuable plant, was for a long time held in utter contempt, being mistaken for the meadow trefoil, which is an utter abomination, and never fails, by its obtrusive character, to destroy the more valuable pasture-plants round it.

FARMERS' SYNDICATE

OF THE

PROVINCE OF QUEBEC,

Office : 23 St. Louis Street, Quebec.

President : His Grace Mgr. L. N. Begin.

General Secretary : Ferd. Audet, N.P. Treasurer : P. G. Lafrance, Cashier of the National Bank.

Send at once your orders for grain seeds, artificial manures, phosphate, agricultural implements, &c.

The Farmers' Syndicate buy for its members live stock for breeding purposes of all kinds : horses, cattle, sheep, pigs, fowl.

Correspondence.

Quebec, March 17th 1895.

ARTHUR R. JENNER FOST,

Editor *English Journal of Agriculture*, 4 Lincoln Avenue, Montreal.

Dear Sir,—I enclose herewith copy of a letter I have written on the subject of *twice feeding*. Believe me I have not written it with an idea of exciting a controversy with yourself or the Doctors, because I am in no position to argue the points upon scientific principles nor do I wish to appear antagonistic to your views before the public, but the evidence of the Ulverton farmers seemed to me at least worth your notice as they all favoured the idea of feeding less frequently.

I have not written the letter necessarily for publication for the reasons above stated, but if you have no objection and think it will be to the interest of your readers, you can use it as you please. The roads have broken up in the country and rendered travelling impossible for the present.

I am, dear Sir,

Yours very truly,
GEO. MOCZ.

FEEDING TWICE A DAY ONLY.

Dear Mr. Editor,

I do not revert to this matter because I have not the highest respect for your own opinion and that of the two eminent professors who answered my former communication, nor am I at all acquainted with the physiological ground on which your argument is based, but I think there must be two sides to the question after what transpired at a meeting of practical farmers held at Ulverton on the 6th inst. I had the honor to deliver a lecture at that place before the Durham farmers' club on the day after your "Journal" arrived containing the letters on "twice a day feeding," and the subject being fresh on the minds of a number of the members present it was referred to and my further opinion asked, I immediately stated that with the adverse opinions of yourself and the two gentlemen who stand so high in their profession, and my want of physiological knowledge I felt I must take a back seat; but knowing my audience contained many practical farmers I requested them to give me their views and the results of their practice. The secretary was requested to take notes, and to my surprise, I must confess, the following testimony of which I possess an original copy was elicited.

Ulverton, April 6th 1895.

At a lecture on agriculture delivered in the Town Hall this P. M. by Mr. Geo. Moore by the authority of the Hon. the Commissioner of Agriculture, after delivering a very able and interesting lecture on the various branches of agriculture to an appreciative audience, Mr. Moore touched on the number of times a day which cattle should be fed, he said that this subject was a new one to him, and on sitting down asked the opinion of any one in the audience on the matter. All who spoke favoured feeding but twice. The following are the opinions of practical men on the subject.

Mr. Benj. F. Reid said that he fed his cattle three times per day, but that the two first feeds were so close together that they might as well have only been fed twice.

Mr. Cyrus Fisk said he fed part of his stock three times per day and some that were at a distance from his dwelling only twice and he thought that the cattle fed twice did the best.

Mr. W. H. Lyster said that he believed in feeding but twice a day because during the past winter he had fed some of his stock three times and the rest of them but twice and considered that the cattle fed two ample feeds did better than those getting three feeds; to say nothing about the saving of labour.

Mr. John S. Lyster, feeding thirty heads of cattle twice per day, ten of them being cows giving milk, the balance being steers, meeting with good success, would not go back to the three or four feed plan, would recommend watering cows twice a day.

Mr. Albert Smith feeds some two feeds and some three, thinks that those fed twice do as well if not better than if fed three or more times per day.

Mr. Thomas Skillen has tried both, and consider two ample feeds to be better.

Mr. Joseph Paton, has been feeding ten steers twice a day all winter and they have done well, would not feed any more frequently.

Mr. J. A. Bothwell says that, "If I had nothing else to do I would not feed my cattle more than twice a day.

My own (Mr. Dunkerley's) opinion is that if we give a good and sufficient ration at two feeds per day with plenty of pure water and a comfortable stable they will do very well, and I don't think there is any need of feeding cattle three or four times per day.

And further I would say with regard to the report of Messrs. Gigault and Leclaire to the Commissioner of Agriculture and Colonization 1894. I think it is best report of the kind I have ever seen; and I also believe that farmers in general may profit greatly by taking note of its contents and practising the same.

As regards the dairy industry of Canada I think if the Government would encourage a system of cold storage that would enable us to put our butter on the English market in a fresh condition the trade would soon be established.

(Signed) J. A. DUNKERLEY,
Secretary Treasurer
Farmers Club of Durham.

With regard to Mr. Benj. N. Reid's statement I had some further conversation as to the feeding and he stated that what he meant by the two meals being so close together, was, that in the morning the cattle were fed their usual grain ration watered and then immediately given their allowance of hay, so that the meal might really be called one in two separate courses and not two separate meals. After this they were allowed to repose and ruminate until the evening when they were again fed and watered as in the morning. This has been Mr. Reid's practice for years, his herd consists of 75 grade and thoroughbreds and about 20 rearing calves, and the most casual observer could not fail to remark the excellence of their condition. This remarkable evidence, so unexpectedly obtained, induced me to make a little further research and from the meagre data I had at my disposal, I quote the following—Mrs. Jones, page 9—"Poor man's cow," says in effect: "Morning a bundle of hay, before milking and a mash afterwards. As day advances you see your cow lying down chewing her cud. At noon she has a small feed of hay (merely a luncheon G. M.) and all the water she will drink and in the evening she is fed for the night.

—And at page 56: "Morning, full feed of ensilage, bran, &c.; noon, water, roots with a little bran (luncheon) 4 P. M. Full feed of ensilage and a liberal feed of hay.

In the *Country Gentleman* March 25th I find the following from a correspondent: "Last year one cow gave us more than 7000 quarts in eleven months, and her milk did not cost quite $\frac{1}{2}$ of a cent per quart"****

"We have raised our average production from 1,800 qts. per cow in 1888 to 3,745 qts. in 1894—**** we give some grain before milking. After milking, we give a light feed of dry rough fodder. When this is eaten we brush the manger, which is made of cement, and clean it, and fill it with nice well water and giving them all they will drink. After this we sweep the manger dry—leaving the cows alone until night—*** Before milking we give grain again, and then we milk them and after that give hay. About 8 o'clock, we again clean out the manger and give hay as before."

From *Hoard's Dairyman* March 22. After giving a formula for a ration says: "Divide the hay and grain into equal parts and feed half at night and half in the morning. Feed straw at any time, either middle of the afternoon or last thing at night give cows plenty of time to ruminate, by which

we mean, do not keep feed before them all the time. And on the same date a correspondent to the same paper says: In the morning the cattle are fed their grain and milked, after which they get what hay they will eat up clean. They are kept in the stable until one o'clock and then turned out to water at the creek. If the day is pleasant they are left out until four o'clock. If not they are put back into the stable as soon as they are through drinking. At 4 P. M. they are fed their grain ration and milked. After milking they are fed their ensilage and left for the night

R. W. Ellis, of Summerset, (sic) Que., in the same paper says: Wofed through December fourteen fairly good Jersey cows and heifers, part of them fresh in milk and part st. ppers, 700 pounds of sweet fodder corn ensilage, 70 lbs. mixed hay, 70 lbs. cotton seed meal, 30 lbs short daily at two feeds morning and night and they gave us an average of 240 lbs milk per day testing $5\frac{1}{2}$ % of butter fat.

I can quite understand that if men fall into the error, Dr. W. McEachran speaking of over feeding at the long intervals that the derangements he mentions will occur, and that stuffing will cause indigestion, but in the case mentioned in my first letter, it will be noticed that Mr. Wilson says: "I study the capacity of each animal and soon discover what is her sufficient ration, this she gets and no more"; and in the case of Mr. Reid, of Ulverton, the cattle are fed slowly that is to say are given time to consume their forage in what we may call two separate courses, and are given a long interval in the middle of the day to ruminate, as also in the night. I do not wish to contradict Dr. Donald McEachran as to his assertion about cattle on pasture, but my own observation and that of all practical farmers to whom I have mentioned the subject lead me to the belief that he is quite correct when the pasture is short and the cow has to be hustling all the time to get a sufficient feed; but turn her into a good one where there is plenty of grass, and when she has eaten as her nature dictates, she will be down and rest in the middle of the day, as a general rule, although there may be exceptions. Believe me, Sir, I have no desire to be contumacious nor oppose my views to men of science and infinitely more learning than I possess and my only desire is to aid our farmers by discussing experiments that may be useful to them in enabling them to perform their duties in the quickest and least laborious way, if they can do so on right principles.

Yours faithfully,

G. MOORE.

Feeding only twice a day seems to us to be a remanet from the days when only hay was given to cattle. It is opposed to the practice of all the great English stock feeders. We have freely expressed our own opinion and are perfectly ready to receive observations pro and con on this matter.—ED.

FARMERS' CENTRAL SYNDICATE OF CANADA,

30 St. James St., Montreal.

Honorary President: His Lordship Charles E. Fabre, Archbishop of Montreal.

President: Hon. J. J. Ross, President of the Senate, Ottawa.

Manager: W. A. Wayland.

The Farmers' Central Syndicate is not a commercial institution, nor is its board of Directors personally inter-

ested, it is simply an intermediate between farmers' clubs or farmers in general, and the wholesale dealers or manufacturers. The large number of orders received from its numerous members commands heavy discounts, and those discounts are allowed to the purchasers. The annual subscription of its members, although a mere trifle, is sufficient to pay all expenses; there is no necessity of having several employees, as there is no stock to be handled, and very few customers to be attended to, all business being transacted by correspondence. Since the foundation of the Farmers' Central Syndicate, there has been a great fall in the prices of goods: machinery, which could not be bought, unless a heavy price was paid, has been reduced from 25 to 50 %; seeds, although large reductions have not been effected, are furnished at the lowest market price, and are always to be relied upon as being first quality; all kinds of thoroughbred cattle are supplied from the largest ranges in the Dominion; in fact, any inquiry about agriculture is attended to by the manager with pleasure; he will readily answer all correspondence from any part of the world. Write for list of prices of this year's machinery, before you place your order elsewhere, it will pay you.

Swine.

TURNING PIGS INTO GOLD,

BY

SANDERS SPENCER.

PART I.

It is a generally admitted fact that the breeding, rearing, and feeding of pigs is one of the paying country industries, and one withal of so interesting a nature that it is surprising it is not more generally followed in Great Britain. The Irish cottier or small farmer would as lief part with the most cherished of his possessions as dispose of his friend, the "ould sow," which is allowed to forage for its living during the greater part of the year, except when it is engaged in the profitable pursuit of rearing a litter of youngsters, some to be sold as weaners, and the remainder to be fattened on and sold, with perhaps an occasional exception to furnish the chief meat supply of the family during the winter. Yet we would not for a moment hold up the system of pig management generally followed in Ireland as one to be recommended for adoption in this country; although it is frequently asserted, erroneously we think, that this primitive manner of keeping the pig is to a great extent the cause of Irish bacon having obtained so high a reputation. It is stated that this natural, if not almost wild, condition, in which the young and growing pigs are reared, causes the muscles and the lean meat of the pigs to become so fully developed that the bacon manufactured from them possesses a far greater proportion of lean meat, that the bacon itself is of a firmer and sweeter character, and that the waste from it in cooking is far less than from the greater portion of the bacon produced in other parts of the world. We are quite prepared to admit that exercise is one of the vital necessities of young pigs, and that the want of it often results disastrously, particularly in the winter and early spring; but we do not believe that the sole or even the main

cause of this excellence with which the Irish bacon was in times past credited, was this semi-starvation system of bringing up young pigs until they were considered old enough to put up to fatton.

The question naturally arises then—to what causes can this high quality of Irish bacon in the past be attributed, since if this can be made clear, it will be simple for the cottier or small farmer on this side the Irish sea to adopt so much of the system, and to discard the remainder, in favour of the better portions of the plan pursued by pig keepers at home. There can be little doubt that the foresight of philanthropists, and of parties interested in the bacon-curing industry, had much to do with the improvement of the quality of Irish bacon. Considerable sums of money were expended in the purchase of the best possible kinds of pigs, particularly of boars possessing length and depth of carcass, fine quality of bone and meat, and with great aptitude to fatten. These were placed at the service of the small farmers at a nominal fee, with the result that after a short time (when the natural prejudice against anything new had exhausted itself), a wonderful improvement was noticeable in the general run of fat pigs sent to the fairs in various parts of the country. Then again, the system of almost every farmer, however small his occupation, of keeping one or more cows and feeding the pigs on the dairy offal not required for the family, tended very much to improve the quality and firmness of the fat pig. The almost universal practice of planting a considerable portion of his holding with potatoes, leaves the Irish farmer with quantities of damaged and small tubers which can only be profitably consumed by live stock, and which, when boiled or steamed and fed with a little butter milk or skim milk and meal, make one of the best possible mixed foods for producing growth and flesh in the fatting pig. Another important factor in the success of the Irish pig manager is the persistent attention which she—the wife—is generally the one on whom the cares and management of the pigs lock falls—gives to the fattening pig, and the frequency with which she feeds the youngsters which are likely soon to be wanted for conversion into money. We cannot praise the usual manner in which our Irish friends treat their cows during her resting periods, nor the almost utter neglect to which the growing pigs are sometimes treated. An increased amount of attention and food would, we believe, result in far more pleasant and profitable returns to their owners.

Among countries in which the condition and the monetary position of farmers and others occupying small plots of land is good, Denmark stands pre-eminent. Some thirty years since the manufacture of mild-cured bacon was carried on somewhat extensively at the small Danish town of Holstebro, in the neighbourhood of which were a large number of small farmers who kept pigs, so that no difficulty existed in the obtaining of a plentiful supply of fat hogs—pigs short, thick, and fat and with heavy shoulders. The produce of this class of pig was without difficulty disposed of at a low but remunerative price to the curer, if not to the producer of the fat pigs, until the enormous supplies of this kind of bacon from the States, Canada, Germany, and other places, and the marked change in the style and quality of the bacon and hams required by consumers, caused this short, fat, and heavy fore-quartered bacon to

become quite a drug on the market, and saleable with difficulty at several shillings per cwt. less than the sides of bacon which were leaner and lighter in the fore end. This was a serious loss to the curer, since the same cost of manufacture was incurred, whilst the margin of profit was considerably reduced.

Only two courses were open to the curer, to cease to manufacture bacon, or to improve the pigs from which he drew his supply by the introduction of breeding pigs from other countries. Like everyone else in search of an improved kind of stock, the owner, Mr. Magnus Kjaer, came to England, purchased several boars, placed them at various points near his slaughter, and allowed them to be used at a nominal fee by the farmers and pig breeders. The result was a comparative success, the drawback being that the boars bought were not of a breed which possessed sufficient length of body, and at the same time were too heavy in the head and shoulders. Mr. Kjaer subsequently paid a visit to Holywell Manor and selected a few boars and sows. These proving a success, other followed, until as many as thirty young boars were exported at a time. The arrival of these at Holstebro would be advertised, as well as the date on which they would be on exhibition, when hundreds of farmers and others interested would meet, and the pigs would be offered by auction, one of the conditions being that the public should have the right of using them at a nominal fee. If the sum realized at the sale was less than the cost of the pigs, this was made good by Mr. Kjaer, who reaped an immense advantage in the improved size and quality of the pigs supplied to his slaughter. This system has been generally adopted in Denmark where the position of the small farmers has considerably improved by the assistance of the government, and by the establishment of co-operative dairy factories and co-operative slaughtering or bacon curing factories. In this small country of Denmark, with a population of a million less than London, there are now from thirty to forty bacon manufactories. These have enabled the successful butter factories to be carried on, as the products of the dairy are taken back by the farmers when they deliver their new milk, and fed to the pigs, these in turn, have been so enormously improved in length, lightness of offal, scantiness of meat, and quality, by the adoption of the system inaugurated by Mr. Kjaer, that at the present time the bacon manufactured at most of the Danish slaughteries compares favourably with much of the Irish, and is preferred to that imported from all other countries. A portion of Canada is an exception, through the far sightedness of the principal bacon curer at Toronto, who has adopted the plan of purchasing and distributing in the Dominion the best English pigs of suitable form and character procurable.

Garden and Orchard.

MONTREAL HORTICULTURAL SOCIETY

AND

Fruit Growers Association of the Province of Quebec.

Montreal, 12 April 1895.

Horticultural establishments Around Montreal.

The descriptions of the following

conservatories is a slight move in the right direction. These might well be followed with more extended descriptive articles on the magnificent private conservatories in the city and its environs. They would bring before the public, and especially the members of the Montreal Horticultural Society, who avail themselves of the boon of being granted permission to visit the different magnificent conservatories during the months of each winter, the very gracious manner in which this favor has always been granted cannot be too highly esteemed by the above Society, and its hosts of visitors during the times they are open to them. To some proprietors an especial offering of thanks might very deservedly be tendered, but it might be a little invidious to draw any comparisons, where each and all have done so well.

The following descriptive articles are from the columns of the "Outremont Guardian" and they might in a horticultural point of view be extended, so that, at any rate something of our horticultural wealth might be known. There are many such treasures in and around Montreal which only want to be known to be fully appreciated. These articles recommended here, and introduced locally by the "Outremont guardian" might contain a list of the principal plants in the different private establishments, their time of flowering &c. By having just such a list the lovers of the beautiful would be put in the possession of informations that would be valuable. They would know when to visit any place (with due permission of course) to see these specialties at their best. Many lovely horticultural gems, although they have not "wasted their fragrance" or this beauty either, might have brought delight to the eyes and hearts of many if they only had known what was in store for them to be allowed to admire. The proprietors of the princely conservatories in and around the city have always shown themselves ready and willing that any one might have the privilege to see and admire this beautiful plants.

Is there anything more elevating? There are few hobbies less harmful.

CONSERVATORIES.

A representative of the Guardian, having accepted the courtesy of the owners of green houses and conservatories in this neighborhood, took the following notes, which we have much pleasure in presenting to our readers: The cultivation and appreciation of beautiful flowers have, perhaps, being at no time more generally developed along the whole line of our populace than at the present time. Immense strides have been taken, and great improvements brought about, in this particular direction, in and around the city of Montreal, during the past twenty-five years. It is not claimed here that we have outtripped others in the horticultural race, but that we have fairly held our own in this scientific and experimental contest. Individuals and companies in other cities have expended large sums of money in developing commercial establishments—notably Toronto—during the last ten or twelve years, and have, owing partly to a more genial winter, succeeded in growing exquisite flowers in quantities to supply nearly all the Canadian trade,—a trade which, previous to the period referred to, was almost solely in the hands of florists of Boston and New-York. Montreal's

demand for flowers, however, may now be reckoned up into the thousands of dollars annually. To supply this demand, and to keep abreast with others in the contest, it is necessary that capital and experience should go hand in hand. Hitherto Toronto has kept the lead in so far as the amount of capital expended is concerned; while Montreal florists appear to have been a more painstaking class, acting from a purely horticultural point of view. Capital and experience, however, are both required whether in horticultural or any other business intended to be a success, to be in a position to not only grow beautiful flowers, but at the same time to do so at a minimum cost. The construction of a house or houses is of great importance, together with all the other equipments in labor-saving apparatus.

A visit to the extensive green-houses of the Mount Royal Cemetery Co., now in full operation, and open to visitors daily from 7 a.m. to 6 p.m., at this season of the year, filled with thousands of plants of every size, and almost endless variety, will not only delight the lover of flowers, but will give the critic ample scope to investigate, and leave him small room for suggestions. Everything seems to fit into each other. It can only be from a feeling of real pleasure that one is strained to attend to the vast number of plants requiring daily care. Vast numbers of bedding plants are raised every year solely for ornamentation of the Cemetery grounds and lots (probably from 75 to 80 thousand, independently of a large quantity of bulbs planted each autumn for early spring decoration. This part of the business is on the increase, and let it be remembered that the whole of this immense output of plants is prepared solely in the proprietors' interest, nothing but the bare cost being expected in return. It is largely appreciated too, as the steadily increasing demand testifies. Scarcely at any time will a visitor be disappointed at not finding something to interest and please. For some time past, the display of Easter Lilies has been good, together with beautiful Spireas, Carnations, Roses, Geraniums, Begonias, with an occasional Orchid to lend its enchantment for a brief space of time. Japanese Lilies, Gloxinias, Achimenes, Tuberosas Begonias, and Chrysanthemums will, in their turn, make their display, and continue to be interesting in their diversity. The above, with forced bulbs of nearly all available varieties, form part of the whole which are in daily display. To drive past, and make a call at these conservatories during any time of the year, but especially during the winter season, and to feel a welcome, has only to be made known to be extensively taken advantage of. Among the rarer varieties of plants, alongside of its aristocratic but sometimes equally beautiful though commoner neighbors, will be found a large and fine collection of the following exquisite hot-house plants, such as Crotons, in extensive variety; Dracenas, Ferns, some fine Palms, beautiful Pitcher plants (Nepenthis), India Rubber trees, young and old; Anthuriums, one of which is in flower now, with the English explanatory name "the Flamingo flower." This alone is well worth a visit to see; it has twelve fully expended blooms on it, and its name in English is given to it owing to its color being almost the same as the beautiful bird it is named after. A small collection of Cacti is also interesting, it only to the Cactus crank, showing how easily a very fine lot may be got up at small expense, as

nearly all this collection has been raised from seed. One very fine plant in full bloom now, in fact it has not been out of bloom during the past two years, is "Alamanda Schottii." To picture this plant with words is a sort of hopeless task, but just imagine a plant eight feet high and six feet in diameter, clothed with beautiful light green, lance shaped leaves, and in size measuring from three inches to six inches long by about one to two inches broad. and then nearly cover such a plant with thousands of pure golden yellow bell-shaped blooms, about three inches long by two inches wide, and you have a pretty good picture of the plant referred to. It has to be seen in order to be properly admired, and a visit to Mount Royal Cemetery's conservatories would not be in vain, even if there was nothing else to be seen at the time. That, however, no intending visitor need be afraid of; and besides the countless objects of interest which can be studied at leisure, the utmost courtesy is

what better way can a loving friend keep up the memory of a departed and loved one, than by planting or strewing a few flowers on the final resting place? Gaudiness and profusion are to be avoided, if possible, in cemetery decoration, but nothing, not even granite, can tell the soul-touching friendship shown in placing a few flowers on the graves of those we love.

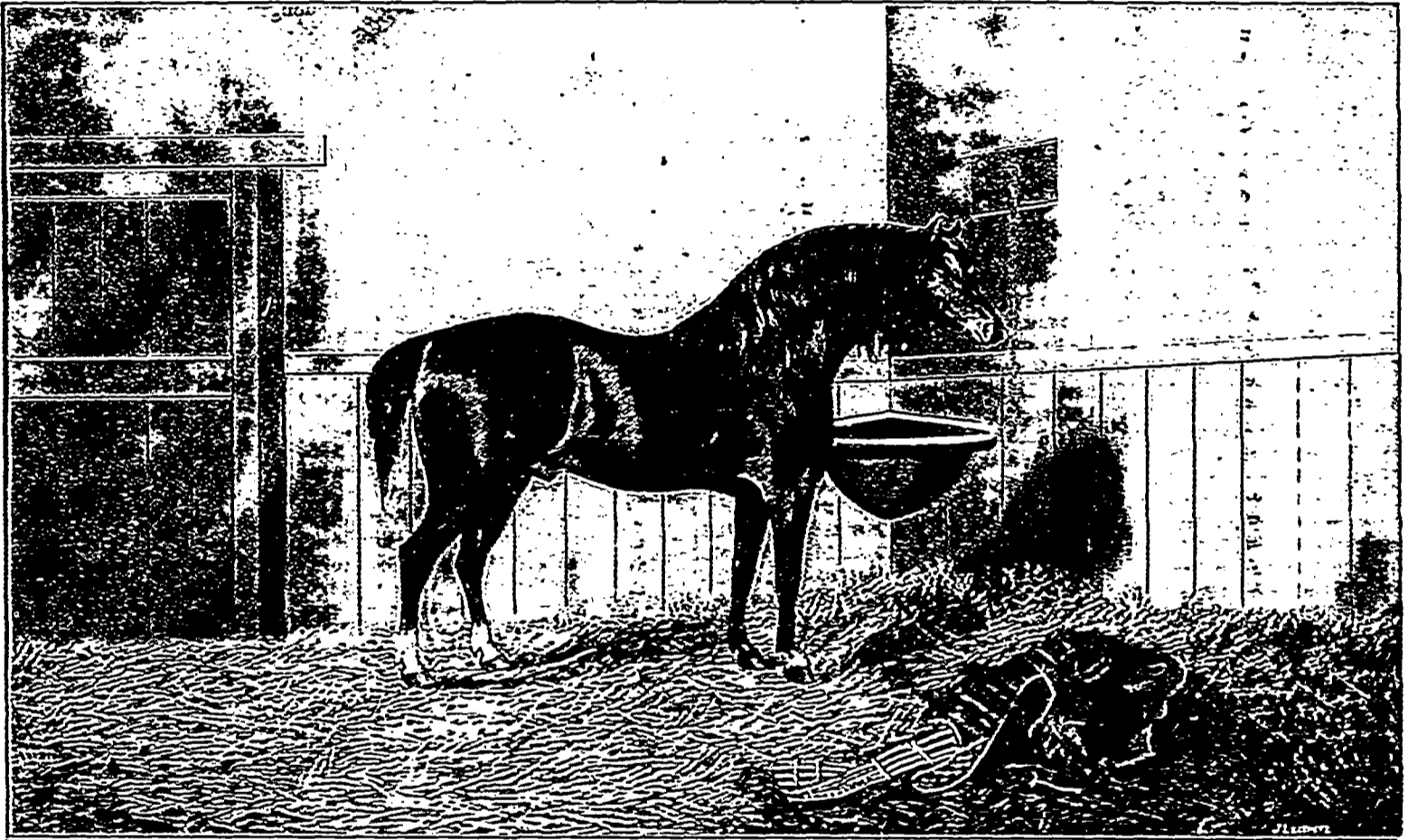
Mr. A Joyce's conservatory comprises three separate houses of about 60 feet along each, and contain some of the most choice plants to be seen anywhere. Prominent among these were Azaleas, Begonias, Hyacinths, Primulas, Amaryllis, Lily of the Valley Primus, Narcissus, Mignonette, Matchett, (?) Calla lilies, Cannas were at the zenith of perfection. One particular flower, a native of Persia, seemed to claim more attention than any other in the conservatory, partly owing to the length of its name, i. e. *Cyclamen persicum-giganteum*. We frequently appealed to Mr. Joyce,

far above mediocrity—is ever ready to supply the name of plants and flowers. Mr. Robinson possesses also the faculty of receiving his visitors in such a manner as to make them feel they are entirely welcome,—and that is saying only a little in his behalf.

Mr. G. E. Cooke's neat though small conservatory, contains probably a greater variety of plants and flowers than are to be found in many of the more extensive houses in Outremont. His Geraniums and Calla lilies are truly magnificent, reflecting the highest credit on his son Charlie, as a florist. We had frequently been invited by Mr. Cooke to call and visit his conservatory, but viewing the house from the road-side, we hardly thought "the game would be worth the candle." What was our surprise, however, on reaching the grounds and entering the small conservatory! Really, we felt somewhat abashed, if not quite ashamed of ourself, and admitted, with apologies, that we had been laboring under a misapprehension as to the

we ever beheld, their names being legion—dracaena, trillium *Hurasii*, pindanus utilis, and other rarities. We will have to return to Mr. Wilshire's on some other day, when he will be quite restored to health, and which we hope will be very soon.

HON. L. BEAUMEN'S collection in this pretty conservatory comprises a very fine display of plants of every description. Among the flowering plants are fine specimens of azaleas, tulips, amaryllis, and narcissus. There are also several varieties of palms and pitcher plants, ferns, etc. Mr. Beaumen's gardener happened to be absent at the time we visited his conservatory; but a young lad kindly conveyed us through with a degree of politeness not always discernable even in adults. We presume he was a member of the family, and that would largely account for his gentlemanly bearing and conduct.



A FAMOUS OLD ENGLISH TROTTER HORSE, "NORFOLK COB," A PROGENITOR OF THE MODERN HACKNEY.

extended to all. One striking matter that was being attended to during the visit of the writer, deserves the thanks of the community, namely, that at intervals, when they are on hand, the Cemetery Trust send what cut flowers can be spared to the Montreal General Hospital for the use of the wards. This, though small in itself, can and does an amount of good, measurable only to the imagination. There is, perhaps, not another field where such an investment would give a larger return. It becomes a "blessing doubly blessed." As pointed out above, the conservatories of the company are employed for the purpose of raising plants sufficient to decorate the grounds and lots; and to what better or more praise-worthy purpose could such be employed? The best plants of different kinds are raised and used for the purpose indicated, the returns from which are only expected to meet the expense of raising them. This has been appreciated by the constantly increasing demand; and in

during our visit, for the English pronunciation or meaning of most of his selection, but we found he was not at all ways equal to our relief, although he undoubtedly felt quite at home as to the treatment and habits of the plants surrounding us on every side, as well as with those in front and rear. In one of the houses we noticed a beautiful display of Ferns and Palms and quite a variety of Roses, Carnations, and Smilax. His Orchids are also very fine, comprising *Cattleya schroedera*, *Cypripedium lecanium*, (?) and a number of other jaw-breaking names which would puzzle some wiser heads than your reporter's to remember. We dare not to undertake to name some of them, for fear of having to undergo a subsequent surgical operation, and will simply advise our interested readers to call and see the beauties for themselves. Mr. Joyce will be delighted to receive all who really appreciate such sights, while his popular gardener, Mr. Robinson—a young man of exquisite taste, with abilities

contents of this gem of a place. Mr. Cooke and his son Charlie, may take our word for it that, proportionately, their conservatory will bear comparison with any in Montreal or elsewhere.

MAYOR DUNLOP'S was the next conservatory we visited, but as His Worship did not happen to be present, and as the time of day was advancing towards six o'clock, we declined a kind invitation from his gardener to await his arrival, promising to renew our visit on some future occasion.

W WILSHIRE'S conservatories were next visited. We regretted very much to learn that Mr. Wilshire was laid up ill with something akin to la grippe, and had then been confined to his bed for several weeks. These conservatories, seven in number, are quite extensive, three of them measuring over 100 feet in length each. Two of these contain nothing but white and red roses. Passing through the other five houses, we notice fine collections of lilies, in one of these were some of the finest palms

The Farm-

THE HAY CROP.

Prairie hay forms a very large proportion of the winter food of livestock here, (*Manitoba*) especially of cattle. It is surprising how large a proportion of it is wasted. Dairy cows are, if good milkers, more fastidious feeders than ordinary cattle, and will pick over an average load of such hay, eating perhaps little more than half of it. Now and then a load will be eaten up much cleaner and with far more evident relish. Why is this so and what is the reason that the other sorts are eaten with much less relish and to a considerable extent not eaten at all? One authority will say the cattle are getting too nice and would eat more of it if they had not too much to choose from. Another will say it is because they do not like it. That is a little

nearer the truth, but the answer does not go half deep enough. The plain truth is the cow is a better judge than her master of what is good for her and she acts accordingly. The food of which she rejects so much is rejected because there is so little real value in it that it is hardly worth eating. The food that was eaten with so different a relish will explain pretty nearly what was wrong with the other sort. It has first of all a fragrant smell which in the other sort is almost entirely lacking. Then it is all one color, a fresh green, showing that it was cut when in the succulent or sappy stage of its growth and afterwards well cured. This sort of hay is more difficult to cure and therefore the men who cut hay at 80 cents or so a ton, wait till it is riper before they begin their season's work. Their favorite mode of hay making is to cut one day, rake up the next and stack the next or soon after. The hot sun dries all it needs and it is quite safe to stack such hay in that way.

It may be taken for granted that hay cut and cured in that way will always have a low feeding value. Many native grasses make very little seed, but the time when such grasses go into bloom is the only time at which hay can be cut so as to get its best value. (1) At that time it contains the greatest proportion of starch and sugar. Every boy knows that the sap in the joints of grass or grain is at that stage of its growth quite sweet, and if cut at that stage the cow knows the same thing and according to the amount of sweetness will be her appetite for it, and the quality and amount of her milk product.

There is another point to be noted here. Very few people know that the sweet smell of well cured hay is due to the presence of volatile oil, which flies off very fast under the influence of a hot sun. (2) Loss of smell is a pretty correct index of the loss of flavor resulting from the same cause. In all countries where plants are collected for their scents, they are carefully dried in the shade because experience has proved that to dry them in the sun means loss of the essential oil on which much of their fragrance depends. A bulky product like hay cannot be cured in the same way as scented herbs are dried, by tying them in bunches and hanging them up under the shade of trees, but the method can be imitated as far as possible and this must be done if the best feeding value for all stock and especially for dairy cows is to be got out of prairie hay. It must only be cut when the dew is off it, and as soon as wilted it should be put into small cocks, by which most of its freshness will be saved. It would pay, when hay meant for dairy cows is to be saved, to handle the cocks twice, making them much larger the second time than the first, so as to have as small a part of the hay exposed to the sun in the process of curing as is possible in the circumstances. In dry hot weather this extra handling will delay the final processes of stacking a few days, but the added value of the product will more than pay for the extra labor. Should there happen to be a cloudy spell less handling will be needed, but the great point in every case is to have the hay cut at the right stage and cured in the right way, so as to retain and preserve all the value that nature has put into it. The longer hay is allowed to stand uncut after that stage the more will it be condensed into woody fibre, and less palatable in proportion. The food, if it

could be retained, is valuable feed, for nature's great effort is to throw all the strength of the plant into the seed, leaving the straw worthless in proportion, but, as such seed is never saved, the right plan is to try and save all its value in the hay itself. Some upland hay has in it a large proportion of weeds and flowers, a few of them palatable, most of them not. Sheep are fondest of upland hay and cattle relish it too, mainly because of the variety. To live for months on one particular plant requires very vigorous digestion and in many cases a straw stack will be preferred if within reach, because in its chaff, seeds of grain and weeds, and the green straw from midsummer stooling, there is more variety and better nutrition than in most of the hay that is made in this country. Let the cutting and curing of hay be more carefully studied if the best results are to be got, and every day's feeding of his winter stock will supply the thoughtful feeder with an object lesson in hay making that he will do well to store up for reference when his next crop of hay is to be gathered. (1)

N W Farmer.

CLOVER AS ENSILAGE

EDS COUNTRY GENTLEMAN—The practical feeder furnishes his stock with palatable and nutritious food containing the proper percentage of both protein and carbohydrates, a ration that his own experience, and a thousand others, have found to be profitable. For the dairy cow it is, say 1, to 6, or 1-7 protein and 6-7 nitrogen-free extract and fat. Now, in producing foods or buying them, we seek those which we can produce the cheapest or buy the cheapest, and both, and as a rule the protein part, which is only 1-6, costs about half, one year with another, of the whole cost of the ration. In growing feeds, a farmer should seek those which will reduce the fertility of the soil the least, and at the same time produce the cheapest and greatest feeding value. We do best when we have a reasonable portion of succulent foods for winter feeding.

Eight years ago, we built the silo as the best means to that end, and in doing so, our experience tells us we made no mistake. Have filled with corn two years, clover four years and part of each two years, and have fed it to all stock—horses, 10 to 15 lb. each per day; cows, 25 to 40 lb.; steers, 25 to 30 lb.; sheep, 1 to 2 lb.; swine, 1 lb. up. One year we carried 50 tons over very nicely. Two years we did not have sufficient, which was not so nice. Our experience with clover ensilage has been as favorable as with corn in regard to cost, quality, and quantity, and value of food preserved.

It should be cut when in full blossom and put in with as little wilting as possible. If cut just before full blossoming, a little wilting is best, and when half the blossoms are brown, it must not wilt at all for best results. It can be siloed either as left by the mower or cut at any desired length with feed cutter. We cut with a six-foot mower and load with a Rock-Island loader, taking out the outside carriers, so that one can take any swath one wishes without disturbing any other or clogging the loader. Loading by hand costs but little more,

taking into consideration the cost of loader; but with it the farmer can do more work in less time. Our silo is between two barns with their bottoms on a common level, and in a hillside, so that we can half fill the silo and not have to pitch the load higher than two feet. The upper half we either elevate with feed cutter elevator or pitch on to a platform six feet up. We prefer to put it all in uncut, as we load the ensilage on a flat hayrack and draw to all the feed yards.

Labor is cheaper and easier to get the latter part of June and first of July, than in September; and no matter what the weather is, we keep putting clover into the silo, except when it is raining; and are sure to have ensilage that is palatable and good. After full blossom, a little rain or water we believe is better than not to have it—or to have it wilted. We usually hay and ensile together, as weather and season permit—more wet, more ensilage put in, more dry weather, more hay made. Clover is the best and cheapest food or fodder the farmer can grow, both as to its protein content, and in increasing the fertility of the soil, instead of depleting it. We grow both medium and mammoth, thus lengthening the time of siloing and haying. Fill as if with corn, keeping the outside a little higher. Put three or four boards lengthwise around the outside with short pieces across them and weight the outside with stone—1½ to 2 cords to our 20 by 40 foot silo—its depth, 28 feet, causes it to keep well in the center without any cover at all. In Canada, where a great many dairymen are successfully siloing clover, they wet the top thoroughly when fall.

The per cent. of loss is no more with us than with corn; it costs us all told from 75 cents to \$1 per ton for the clover in the silo. Corn costs us from \$1 to \$1.25 per ton. We grow on an average 12 tons per acre of green clover per year. Our best weights have been 15 tons of mammoth and 12½ tons of medium in one cutting. Our corn has averaged about the same, and 15 tons per acre was our best yield. The above are actual weights, not guesses. We grow 30 to 50 acres of corn per year, cut and bind with machine, set up in large shocks, stack in 10 by 30 ricks when dry and cover with chains and boards, and can use all we can take care of during summer in this way.

Our barns have 150 or more tons of clover hay, and the protein in the ensilage is greater and cost less in ensilage than in the hay, which, taking weather into consideration, is obvious. We have failed to grow clover, or rather had it kill out and then corn was planted for ensilage as we must have some succulent food, and in our experience there is no way to harvest and preserve either corn or clover so cheaply as in the silo. Neither is there any other way of having the fodder so palatable and nutritious as in ensilage.

Clover is first in Wisconsin husbandry, and, I think, in that of any State, and we can have it every year if we will. Corn is second, and a good one, in most States in this latitude. Can we farm profitably without them? Are we studying them as closely as we ought to? It is for each one to decide for himself the best use for either or both crops, and he who best succeeds with clover, in all its bearings and benefits best succeeds as a farmer.

Dodge County, Wis.

A. F. Nozys.

The Horse.

BREEDING FROM HEAVY MARES.

We all know that a great many splendid draft mares will not have foals this spring, simply because they were not put to the horse last year. We have no doubt many owners of such mares are undecided whether or not to breed them during the present season. The decision will largely be governed by the hopefulness or lack of it in the individual men.

It is well to remember before deciding not to breed, that it takes five years from the time of service till a mature horse is obtained. There is no doubt in our minds but that long before five years have gone round, good horse stock will be in lively demand. The number of old, superannuated nags that have been destroyed during the past winter is enormous, which will to some extent make an opening for better animals. [In Toronto, not to go further from home, hundreds of horses have been fed to hogs, or ground up into fertilizers, since last autumn, many of which would have brought from \$15 to \$30 five years ago.] The street life of a draft horse is short, therefore the necessity of a constant supply of fresh blood, to keep up to the demand. We would not advocate breeding from inferior mares, nor using non-descript sires, that as is unwise any time. Unsound or ill-shaped mares should be sold off the farm if possible, or put to work which will pay their keep, without raising a foal to fill the same undesirable position as their dam in the horse-world.

Farmers who own sound, shapely draft mares, need have no hesitation in putting them to first-class stallions of the same breed. Remember that the best is none too good, and it is economical to use such, even though the service fee is a little high. To those who can muster faith in the demand for good horses, which is sure to come, a splendid opportunity is now on hand to purchase a few good draft mares from men who have them and have lost heart, and want money rather than mares.

Good draft horses even to-day will sell at a price that will buy nearly as many necessaries of life as the price of the same stamp of horse would purchase some years ago. Undoubtedly coach, park, and saddle horses, when of the right stamp and well trained, will sell more satisfactorily than any other sort just now; but when we compare the necessary expense and risk in bringing each of these classes up to saleable condition the difference in profit does not seem so much in favor of the lighter sort. One writer puts it in this way: "Out of a dozen attempts by the general farmer to prepare for market a high priced light horse, more failures than successes may be expected, while four out of five attempts to rear a saleable draft horse at a paying figure will be successful. A half-dozen colts of the draft type will probably net the farmer, at maturity, more money than the same number of the light type."

Without discussing this proposition, this much is certain. That the finer bred colts demand an extra amount of handling, breaking, training, and fitting, which the average farmer is not in a position to undertake; besides, a slight mishap or defect is a much more serious matter in the case of a fancy horse.

We notice that in an address by Alexander Galbraith, Secretary of the

(1) Very good.—Ed.
(2) Good, again.—Ed.

(1) What is true of prairie hay is also true of meadow hay in general.—Ed.

American Clydesdale Association, to a Wisconsin Farmers' Institute, he mentions that draft geldings sold in Chicago a few weeks ago as high as \$200 at auction, when common and undersized ones were going as low as \$50. In that Western country we hear of \$150 to \$200 being paid for good, smooth 1,500 or 1,700 pound horses of proper age and conformation. Mr. Galbraith also says that he "firmly believes that before there is time to raise any more horses old enough to work, we shall experience such a revival in the general demand that farmers will wonder why they could have been foolish enough to leave off breeding merely because prices had temporarily become low."

We can also take a lesson from the present feeling across the Atlantic. At the recent annual meeting of the Clydesdale Horse Society of Great Britain and Ireland, attention was drawn to new features in the outlook for breeders there. One element in the horse trade of the year, fraught with influence on Clydesdales, was the growth of foreign importations, which during the three years ending 31st December, 1894, numbered about 10,000 head. The majority of these were of a lighter type than the Clydesdale, but the abnormally cheap price at which they reached the British market produced a glut among that sort of horse stock. The Society learns from this fact that their efforts must be directed toward producing the heavier type of horse, suitable for the demands of the street traffic, which advice is, without a doubt, just as applicable on this side the Atlantic as the other.

Of course, in the case of men with light breeding mares, and whose inclinations do not run in the heavy-horse groove, these observations do not apply, and by them an entirely different course must be pursued, but which does not come within the scope of this article.—*F. Advocate.*

HORSE BREEDING FROM A FARMER'S STANDPOINT.

BY "CLAUGHBANE."

The Hackney, as a sire, is one of the best farmers can use. He is exceedingly handsome, and the high action for which he is noted has become hereditary with him, and while he can go at a good pace, he is not nearly so speedy as the Standard-bred horse, but being very stout and powerfully built, with stout bone, he is capable of covering a great distance in a day. Mares with much cart blood in them are not generally suitable for mating with the Hackney. He will be useful for a lighter class of mares, those of trotting blood often being very suitable, as he will give rotundity to the form of their progeny as well as giving them strength and action. The Hackney will also be a good sire to use on really good pony mares, for ponies, if of the Hackney type and having good action, are valuable. One thing that can generally be looked for in the get of the Hackney stallion is that they will pick up their feet prettily, a most important point, and one the Canadian farmer, as a rule, does not give sufficient attention to. Beware, however, of mating him with large, coarse mares; it is all right to breed large mares to him, but they should have plenty of quality. There are numbers of mares on Manitoba farms that, if mated with Hackneys, would produce colts that would bring good money for export.

The Hackney is at present so popular that really good stallions of the brood are too high in price to make them plentiful in Canada. There are not so many mares in Manitoba suitable for mating with the Coach horse as with the Thoroughbred; in fact, in my opinion they are, comparatively speaking, few. The reason is this: the Coach horse is, as he stands to-day, the general purpose horse, but at the same time he is not gifted with too much quality, and what he has not got himself he cannot impart to the progeny of mares that have less. The greater number of farm mares have not sufficient quality to nick well with a Coaching sire. I do not say that all Coach horses are deficient in quality, but as a breed they are, when viewed from a farm-mare standpoint. When a farmer has a clean-legged mare with plenty of quality, he might do much worse than put her to a Coach horse. There are numbers of smallish boned mares in Manitoba, often rather weedy looking, but with lots of quality; such mares will raise fine colts if put to a Coach horse; and if the mare is roomy and a good milker and the colt well done by, it will often turn out of such a size that one not knowing would never dream that the mother was undersized. I have said the Coach horse is the general purpose horse, and I maintain that the horses shown at our Agricultural shows as such are not general purpose horses, but ought to be classed as agricultural light draught, or something of that kind: they have all, more or less, cart blood in them, and would look quite out of place before a buggy. Now, the Coach horse, while not a perfect light driver, is by no means out of place in that capacity, and is quite at home when required to make good time with a good load behind him; he is, moreover, a right down good horse in the plough, being good-tempered and having plenty of weight for the work; and though some may think he is not large enough, the scales will show that he weighs as much as many horses that look heavier, being upstanding and clean legged, giving him this appearance. Then, again, while not a perfect saddle horse, he is not out of place when carrying a man, but will do it well and with ease to himself. In his purity he is all things considered, the beau-ideal of a general purpose horse. But we have very few mares suitable for mating with him to produce this class of animal, for the small class of mares I have spoken of as suitable for breeding to the Coach horse will not, as a rule, produce horses big enough to come under the head of general purpose horses. Under these circumstances we must rely on the Thoroughbred to beget our general purpose horses, and this he is most capable of doing when bred to large, cold-blooded mares.

In breeding light horses farmers must use their judgment as which breed is suitable for each mare. There are some mares that could be profitably put to the light horse of any one of the three breeds that have been named; and then, again, there are many others that would not be suitable for mating with more than one, as, for instance, these large mares of more or less draught breeding, which the blood of the Thoroughbred alone can modify and give to the progeny that quality which is required in a valuable light horse.

Do not breed from a mare at all if she has any glaring defects in conformation, for she may reproduce these in her progeny, when they will be of little value, the aim being to breed something good, and this can not be expected from an ill-formed mare. Then,

again, to raise a good colt, a good sire is required, and good sires require good service fees, and money can scarcely be said to be well invested if paid out on the chance of a poor mare producing a good colt.

Above all, do not breed from mares with any hereditary unsoundness,—they are worse than useless for the purpose.—*F. Advocate.*

OUR ILLUSTRATION

NORFOLK COB.

Coming down to about the year 1839, the great Norfolk Phenomenon was then in his prime. He was got by the famous Norfolk Cob, a life-like representation of whom, in his prime reproduced from an old steel engraving, is our frontispiece. His dam was got by old Marshland Shales. As his appearance in the portrait indicates, he was well worthy to rank high among the progenitors of the Hackney race. Norfolk Phenomenon was the property of Mr. Wright, Rougham, Norfolk, later coming into possession of John Theobald, Stockwell, Surrey, by whom he is said to have been named. He was out of a Pretender mare by (Reid's) Old Fireaway; his grandsire, Young Fireaway, bred by Mr. Burgess, Well-Fen, Norfolk, great-grandshire, Old Fireaway, the property of Mr. R. West, Gaywood, Norfolk, great great-grand sire, Fireway, from whose stock the original Fireaways are descended. Norfolk Phenomenon was a roan, bred about 1825, his dam was a very fast trotting mare, and never was beaten. She bred many valuable horses, eight of which sold for £1,050, exclusive of Phenomenon, which in his time stood first as a Norfolk trotter. He bore a remarkable resemblance to Mambrino, one of the first of that name from which many of our American trotters are descended. About the year 1838, one H. R. Philips purchased Phenomenon from Robert Ramsdale, of Market Moighton. Mr. Philips said he considered him at that time the best stallion in England, and he knew of no animal that beget progeny so good and valuable. He is described as a big-boned horse on short legs; height 15.2, girth deep, quarters symmetrical, legs flat, feet good; full of courage, and with wonderful action. He was afterwards taken to Scotland, where he trotted matches, being then nearly 30 years old, and is said to have died at Edinburgh.

Among other noted progenitors of the Hackney horse we may mention the celebrated and matchless mare, Phenomena, (1) which was for years the admiration of the sporting world. She was under 14.2 hands high, was bred in May 1788, at Melton Park, in Norfolk. Her dam was a half-bred mare, and Othello, her sire, trotted (April 11th. 1796, on the Highgate Road) seventeen miles within an hour; he was afterwards bought for 1,800 guineas. Some of the mare Phenomena's performances may well be mentioned. When twelve years old she was matched to trot seventeen miles within an hour, on a country road, which she performed with ease in 56 minutes. A few months later, her former feat being doubted, she was started again over the same distance, which she did in something less than 53 minutes, four miles of which was done under eleven minutes, when it was declared by the onlooking sporting gentlemen that she (almost?) literally flew. When she was 23 years

(1) A rather awkward termination, as our classical readers will observe.—*Ed.*

old she trotted nine miles in 28 minutes 30 seconds. Many more such performances by old Hackney progenitors could be cited, but sufficient has been given to indicate the sort of foundation from which the present popular breed of equines has arisen.

Mr. John Armstrong Storey, Shaftesbury Road, Hammersmith, an old Hackney breeder, writing in November, 1878, regarding the Norfolk trotters, says:

"As a breeder of that class of horse, during 40 years of my residence in Norfolk, I trust a few remarks from my pen will not be deemed presumptuous. The first point for consideration appears to be, 'What is a Hackney?' Doubtless it is the produce of Thoroughbred and old Norfolk strains of blood so blended and cultivated that an almost distinct race is established, combining all the desired characteristics of the two families in an improved model frame. (1) The task is by no means an easy one, and may take years of study to effect, for continual disappointments will arise through a tendency to breeding back to one or other of the original stocks. Under the most favorable circumstances it must be a tedious process, as no horse can pass muster as a Hackney unless he can boast of three generations untainted by nearer proximity to either of the original roots of parentage. This rule, which has been accepted through all ages, I hold to be imperative as the safest and soundest definition of the Hackney strain of blood. It is necessary, in blending, to study closely the symmetrical points required. Perhaps they can best be defined as exhibiting the elegance of the Thoroughbred above the line, with the substance of the cart-horse beneath that limit of demarcation; but the shoulder must be deep and lie well back, with withers well upraised; the arm long, and full of muscle; the legbone short, flat, and largely supported with sinew; the fetlock short and strong, the foot circular and tending to be upright, the frog well-hollowed out and pliable; the thigh must be muscle itself, hook clean and accurately jointed, the hind rib being short, that he may the better 'Gang away and fuck his haunches in.'"

For centuries, then, Great Britain, the world's greatest fountain head of pure-bred stock, has had a distinctive type of trotting horses, which for a hundred years past has practically been a breed, though not till ten years ago were the scattered historic records collected in the form of Hackney Stud Book—*Farmer's Advocate.*

THE HORSE YOUR FRIEND

This being so, be sure to keep the harness soft and clean, particularly inside of the collar and saddle, as the perspiration, if allowed to dry in, will cause irritation and produce gall. The collar should fit closely, with sufficient space at the bottom to admit your hand; a collar too small obstructs the breathing, while one too large will cramp and draw the shoulders into an unnatural position, thus obstructing the circulation. Never allow your horse to stand on hot, fermenting manure, as this will soften the hoof and bring on diseases of the feet; nor permit the old litter to lie under the manger, as the gasses will taint his food and irritate his lungs and eyes.

(1) The best hackney we ever possessed was by a thoroughbred out of a Welsh pony. She could trot a mile in 3 minutes, under saddle, and was practically untirable. She was shot at 24 years of age.

The Dairy.

Handling Cows and Heifers—Cows With Highly Nervous Temperament Not Always on the Rampage.

ED. HOARD'S DAIRYMAN. — Some time ago one of your correspondents wrote of his cows being restless while being milked. I was having a like trouble at the time. They would very often move away from me so that I would have to follow suit or move their left foot back. One cow would back to the edge of the drop and hang over as far as the stanchion would allow her.

While visiting Mr. S. E. Guernon last spring, I noticed that to get one cow in proper position, he grasped the left leg above the hock and drew it forward. This gave me the cue. Now when I milk a heifer, if she is very restless, I push my head into her flank and grasp the ham string with my left hand. If, however, any one should handle a vicious kicker in this way, they must not blame me for the probable consequences. I can handle any heifer that we have raised in this way.

Another source of annoyance was to get them to stand around. If I would push them they would lay over against me. One was so that I finally took the fork and pressed against her until she did stand over. She needed this lesson but a few times, but it damaged me in her estimation.

Now, to induce them to stand over, I will push them with the leg of the milking stool, or with my knee on the side of the hock.

Our cows are extremely lazy. They are lying down most of the time while in the stable, except while eating. We have considerable trouble to get them up to be milked. We have to keep punching some of them until they are fairly on their feet or they would drop down again.

It might be supposed that they do not have the nervous temperament, which we consider so essential to dairy animals, but strangers going amongst them would soon observe that there is nothing phlegmatic about them.

In the DAIRYMAN of late there has been discussion relative to the feeding of new milk to calves. It is my practice to feed new milk or whole milk until I get them to eat a fair ration of grain, and then to substitute creamery skim. I have fed scalded oil meal in the skim milk to young calves, but seldom with success. I think that in the end the feeding of new milk pays me well, although others think differently.

A. L. GREENG.

Waukesha Co., Wis.

THE MERITS OF LUCERNE

BY W. A. McGEACHY, KENT CO., ONT.

Lucerne (or Alsika) (1) is a forage plant that is rapidly gaining favor with farmers and dairymen, especially those who have poor land of light, sandy nature, for, although it does well on any soil if well drained, sand seems to be its natural home, and on such its roots have been known to penetrate to a depth of from fifteen to twenty feet. A few years ago, upon the high recommendation of a neighboring dairyman, we purchased enough

(1) The lucerne on the Senary Farm, Sherbrooke St., Montreal, is now (May 17th) 15 inches high.—Ed.

Lucerne to seed down one of our fields, and, I must say, we are more than satisfied with results. Unlike Red clover, the seed is rather large to be sown on fall wheat, but does well on any spring-sown grain. Ours was sown broadcast on oats at the rate of fifteen pounds per acre, and then lightly harrowed. If two or three pounds of Red or Alsika clover is added it both thickens and improves the first crop. If the Lucerne does not appear very heavy on the start, don't plough it up, as the older it becomes the thicker it grows, and in a short time it will run the other clover out, and there is not a weed but what will follow the clover sooner or later. As pasture it is excellent, affording abundant herbage during the driest of seasons, as the tests of the past two years have proved. We have had all kinds of stock pastured on it, and they all relish it, thrive and grow fat. Our calves came right through fly time on it last year, and came into the stable in the fall in grand order. The only points to watch in pasturing is to see that the dew is dried off and that the stock are well fed before turning them on the first time. (1) In sections where soiling is practiced it will be found invaluable coming in as it does so far in advance of peas and oats or the common clovers. Dairymen in these parts begin cutting it for this purpose about the first of June. We would highly recommend it to those wishing a good early soiling crop. When cut for hay it should be mown when out in full blossom, which is generally about a week in advance of Red clover. Care must be taken to see that it is thoroughly cured before mowing away to prevent heating. At the same time it must not be allowed to become too dry, as the leaves, which are the most nutritious part, become brittle and drop off. But if bunched after lying in the sun several hours, and then allowed to stand a few days, it makes splendid hay which, though rather coarse after the first few cuttings, is relished by all stock. To test the feeding qualities of Lucerne for horses, a neighboring farmer has fed his nothing else during the past winter, and they are coming out this spring in grand condition. He has placed good timothy and Lucerne before them, and he says they prefer the Lucerne every time. We have cut ours three times in one season, and then pastured it, as it is hard to get favorable weather for curing it in the fall. Last year, after taking off one crop of hay, we kept the next for seed. We had it threshed by an ordinary clover mill, and from three acres we threshed thirteen bushels of first-class seed which sold for from five to six dollars per bushel. A crop that will turn off two tons of hay and twenty-five dollars' worth of seed per acre per annum is one that, we think, should commend itself to every farmer's most earnest consideration these hard times.

Last, but not least, are its fertilizing qualities. When found necessary to plough it up, the dense mass of roots greatly increase the fertility of the soil. Those who have ever tried ploughing an asparagus bed will have some idea of what ploughing Lucerne is like; but all that is necessary plenty is of horse-power and a good sharp plow. In conclusion, we would advise every farmer to give Lucerne a trial, and if it does as well with everyone as it does with ourselves and neighbors, they certainly never would be without it.—*F. Advocate.*

(1) We should prefer always mowing lucerne and letting it wilt for 4 or 5 hours. Pasturing it is very dangerous.—Ed.

MEDDLING WITH MILK.

To meddle with such a thing as milk means, as I take it, to interfere with or alter it somehow—to change its value, to lower its composition, and so on—with the object of deceiving the customer, or of making an unfair profit. The adulteration of milk with any extraneous liquid or solid, and the skimming of it—where skimming ought not occur—both come within the scope of meddling, and are equally reprehensible from a moral point of view. But the morality of this transaction is not all, though in truth it were quite enough; and even if the offender be detected and punished, that, too, is not all; for to some undefinable but very considerable extent the innocent suffer for the work of the guilty. This last, indeed, is a great deal more than enough. This last, in point of fact, is at once the reason and justification of any strictures that may be uttered against meddling with milk. But there is the further justification, viz., that, as we see from the Press reports, the practice of adulteration is still prevalent, whilst that of depreciation by skimming is understood and believed to be increasing at an alarming rate. This sort of annoyance and deception is not confined to the wholesale and retail milk trade; it is not by any means unknown at cheese factories and creameries, where milk is received from a number of farmers resident in each district respectively.

When a farmer sends his milk to a cheese factory, and is understood to send all he has, save what may be required in his household economy, it is rather suspicious if he has a basket of butter—no matter how small it may be—to dispose of week by week. This, of course, may possibly mean no more than this, viz., that he prefers to keep a given quantity of milk at home, skim it, use or sell the butter, and feed the skim-milk to pigs or calves, or even to horses. All the same, however, the sale of butter by anyone whose milk is known to go to a cheese factory or a creamery has an unexplained aspect that is really suspicious. It is difficult to account for that marketable butter—difficult, I mean, to one who is not behind the scenes, and who simply knows by some means or other that such butter is there, needing explanation. Who, indeed, would fail to deem it passing strange that a man who sent milk to a factory at all should not send the whole of it? If the man liked to make butter at home, why not keep all his milk rather than only part of it for that purpose? It is a well-known circumstance that at every cheese factory or creamery—well, at almost every one—this difficulty exists, this meddling at times with milk by some one or other of the farmers, or of the farmers' households, who send the milk. Not uncommonly, indeed, the farmer himself knows nothing about what is going on.

"For added water, separated milk, or other extraneous substance the percentage found by weight in any single sample will be doubled, and a deduction made in that proportion for the whole month at the then current price; thus, if 5 per cent. of water, separated milk, or other extraneous substance is added, no payment will be made for 10 per cent. of the milk delivered during the month. For abstraction of fat, a deduction of 3d. per gallon off the milk will be made for every half per cent. of fat below the standard, or proved to have been abstracted. If the milk is not of good quality in other respects, the company may reject it altogether without liability to return it." The

foregoing quotation is a clause taken *verbatim et liberatim* from the contract which has to be signed by all who send milk to a certain company who are largely interested in creameries in this country. The clause is severely penal, no doubt, though at the same time no honest man—no man who was not consciously dishonest—would object to sign it. The "standard" of quality required by this company is 4 per cent. of fat during November and December, and 3½ per cent. for the rest of the year, with 8½ per cent. of solids all the year round. This standard will be admitted to be reasonable, and the penal clause is doubtless necessary. Seldom, indeed, would the milk of any herd of cows fall so low as 3½ per cent. of fat and 8½ per cent. of solids, though, no doubt, the milk of some few individual cows would not attain to that irreducible minimum. It would seem, however, that if honest farmers are liable to be mulcted when their milk falls below 12 per cent. of total solids, it would only be fair if they were credited with, say, ½d. for each half per cent. of fat above the standard. Whatever may be said on this aspect of the case, perfect fair play—so far as such a principle is really attainable in the milk business—will not be established until milk is bought and sold on a basis of quality, carefully and constantly—almost daily—ascertained.

If this system of payment on the basis of quality were established and generally understood, it is obvious that no penal clause would be needed in milk contracts. No temptation to be dishonest would exist. To put separated milk into virgin milk with the object of lowering the quality of the latter would then lack the necessary inducement, and would, consequently, sooner or later become a lost art. If temptation were taken away, even men of easy virtue would in time learn to be honest. There would be no sweetness left in the stolen fruit, and so in time it would not be stolen. To adulterate milk for the mere fun of adulteration, and not for illicit profit, is a fantastic conception only to be entertained or practised by some person afflicted with mental obliquity. The best and most successful manner of doing away with adulteration is to deprive it of its life-breath, viz., profit.

But it is not only the managers of factories and creameries that have to contend with this chronic nuisance, meddling with milk. The "middlemen" in the milk trade have to be on constant guard against it, and the consumers—commonly and helplessly enough—are wronged by it. No large milk-buyer can afford to do without the constant services of an analyst; small buyers have to manage as best they can, and put up with the wrong. Nowadays there are frequent complaints as to the unfairness of separated milk in the trade—the mixing of it with milk fresh from the cow, real milk that has not been meddled with. Here, again, a penal clause in contracts is obviously necessary, until such time as milk shall come to be sold on a quality basis. At the present time it is those who are dishonest, and the men whose cows yield second or third-class milk who are the delinquents; the latter, however, are, presumably, free themselves from fraud, but the cows are not. So far as the work of the delinquent is concerned, the innocent only too commonly suffer with the guilty—and not the innocent consumers only, but the innocent producers too. At a factory, for instance, the milk sent in bad condition, or deprived of its cream, is paid for by the other contributors *pro rata*, until

to use sporting words, the defaulters are "bowled" or "caught." This sort of thing has in some cases caused honest folk to sever their connection with factories. And in respect to the milk trade, those who mix separated milk with real milk, and sell it all as real, do great injury to the reputation of the trade, and cause the public to use less milk than would otherwise be the case. Some of them do this, it is said, in order not to injure themselves by selling milk that is richer than the law requires or the trade expects. Well, if this be true, it is a powerful argument in favour of a quality basis for the sale of milk. Too commonly, now, the innocent suffer with the guilty, and it is clear that while no clause can be penal enough to matter anything at all to an honest man, it can hardly be severe enough on those who, when they dare, are certain to meddle with the milk.

J. P. SHELDON.

THE SALTING OF BUTTER.

A few days ago I heard a lively argument about the salting of butter, and as I am at present one of the noble army of unemployed, awaiting a call to action, it has struck me that perhaps a few words on this subject may just possibly be of interest to the readers of these columns. Well, the debate turned on the rival merits of dry-salting, which consists, of course, of adding salt in the dry lump, and brining, namely, dissolving in water and allowing the butter in question to lie in it some time. One of the company, who evidently knew how to both brine and dry-salt butter, did not approve of the latter, but, in fact, utterly condemned it. She stated that a short time ago she had, by request, dry-salted a churning of butter, which, when it was worked and ready to make up for market, showed two distinct shades of colour — what we should term "atresky." This was, of course, attributable to bad workmanship, namely, the salt not having been assimilated with the butter. Everyone who is a practical dairy-woman knows that if dry block salt is not thoroughly well worked in, the butter will, when cut with the slicer, show two shades in this manner. In this identical case, too, I found that the butter had been churned all right, till the grains were the correct size, then well washed; but instead of being then taken from the churn and placed on the worker in granular state, it had been churned again while in the lump, and dry salt added at last. Had this butter been taken out and salted while still in grains, and really well mixed, we may rest assured that it would have shown a uniform colour, but I am stating what occurred. It seems almost incredible, but there are some persons who aver that butter cannot be made in perfection if dry salt is used; but this is absurd, for some of our very finest is made with it, and in no other way.

Now, when butter is required for winter use, and is to be preserved, I do not consider that a sufficiency of salt can be incorporated by brining alone, but that it is absolutely necessary to add a certain amount of dry salt. In fact, I prefer the dry salt alone, if it can be, for brine being some degrees colder than the water in which butter is washed, it becomes hardened if it remains long in it. Indeed, when the butter is taken out to be worked, it is so hard as to run great risk of having its grain and texture spoiled by the process. In the summer-time, on the contrary, it is just as advantageous to

brine, as with warmer weather we often experience a difficulty in securing water at a sufficiently low temperature for cooling, so as to render the grains nicely firm for working.

If anyone, for example, makes a brine in the proportion of one quart of salt to one gallon of water, and lets it remain on the butter for ten minutes to half an hour, according to the amount of salting required for the butter in hand, it will be found to be firm and easy to manage. The strength

of brine can be varied as wished but the above quantities will be found advisable.

Then, another of our debaters made the complaint that the strength of block salt varies very considerably. Quite so; and if it varies when used in a dry state, it must also in like proportion affect the strength of the brine. But in any case the greatest care has to be taken to ensure the butter not being too highly salted, and yet sufficiently so, either dry or wet. There are persons also who have a

decidedly strong objection to brined butter at all, and say they prefer what they term "good old salted butter." Whether they could really detect any difference, if both were treated with due care and attention from the outset, I very much doubt. Still, if we are considering a case where customers are concerned, of course it is always wise to do what we can to please and humour them. No one has so great a right to be thought of as the consumer of anything.—Ez.

M.

SUMMARY OF THE COMPARATIVE RESULTS OBTAINED FROM THE DIFFERENT BREEDS OF DAIRY-COWS, EXPERIMENTAL STATION, GENEVA, N. Y.

AVERAGE PER COW DURING A LACTATION-PERIOD (10 MONTHS).

	Holder-ness	Ayrshire	Devon	Guer-nesey	Holstein	Jersey	Shorthorn
Number of cows.....	2.	4.	3.	4.	4.	4.	1.
Total number of periods of lactation.....	4.	12.	5.	6.	4.	11.	2.
Cost of food consumed.....	\$42.90	49.32	37.52	46.15	50.73	45.49	46.22
Quantity of milk given, in lbs.....	5721	6824	3984	5385	7918	5045	6055

Yield of milk

Cost of milk per lb., in cents.....	0.76	0.74	0.94	0.86	0.65	0.90	0.78
Cost of milk per quart in cents.....	1.63	1.58	2.02	1.85	1.39	1.95	1.68
Pounds of milk-solids produced.....	724.1	869.4	577.4	804.0	936.5	775.4	866.2
Per centage of milk-solids.....	12.66	12.74	14.50	14.93	11.83	15.37	11.30
Cost of solids in cents.....	5.93	5.68	6.50	5.73	5.42	5.87	5.34
Value of the milk at 1.28 cts a lb.....	\$73.22	87.24	51.00	68.93	101.35	64.58	72.50
Value of the milk calculating solids at 9 1/2 a pound.....	67.58	81.14	53.89	75.04	87.41	72.37	80.85
Value of milk taking the butter fat at 2 1/2 a pound.....	56.12	64.47	48.27	75.18	70.07	74.30	72.03
Apparent profit, i. e., value of the milk less cost of food.....	24.69	31.73	16.37	28.83	36.65	24.63	34.60
Value (estimated) of the skim-milk.....	15.61	19.06	12.00	15.81	20.49	13.78	18.20
Market value of skim-milk.....	7.81	9.53	6.00	7.90	10.25	6.89	9.10
Real profit i. e., apparent profit less market value of the skim-milk.....	16.88	22.20	10.37	20.98	26.40	17.74	25.50

Yield of butter and cream

Per centage of fat in the milk.....	3.73	3.60	4.60	5.30	3.36	5.60	4.44
Pounds of fat yielded.....	213.1	244.8	183.3	285.5	266.1	282.1	269.0
Pounds of butter yielded.....	239.9	275.2	208.4	325.6	298.1	322.4	305.1
Pounds of butter made per 100 lbs. of milk.....	4.20	4.05	5.22	6.05	3.76	6.40	5.04
Pounds of milk to make 1 lb. of butter.....	23.80	24.70	19.15	16.53	26.60	15.63	19.84
Pounds of butter from 1 lb. of fat.....	1.126	1.125	1.135	1.14	1.12	1.143	1.135
Cost, in cents, of a lb. of fat.....	20.13	20.15	20.47	16.14	19.06	16.12	17.18
Cost, in cents, of a lb. of butter.....	17.90	17.92	18.00	14.15	17.02	14.11	15.15
Value of butter produced.....	\$59.98	68.80	52.10	81.40	74.53	80.60	76.28
Profit from the butter.....	17.08	19.48	14.58	35.25	23.80	35.11	30.06
Pounds of cream produced.....	1065.5	1224.	916.5	1427.5	1330.5	1410.5	1315.0
Pounds of milk to the pound of cream.....	5.37	5.58	4.35	3.80	5.95	3.60	4.50
Cost of cream per lb., in cts.....	4.03	4.03	4.09	3.23	3.81	3.22	3.44
Cost of cream per quart, in cts.....	8.50	8.50	8.63	6.82	8.04	6.79	7.26
Value of the cream produced.....	\$101.00	116.02	86.86	135.27	126.10	133.70	127.48
Profit from the cream.....	57.03	65.48	48.44	87.70	74.04	86.80	78.92

Yield of cheese

Pounds of casein in the milk.....	139.3	164.7	112.1	155.4	185.0	150.8	172.9
Pounds of green-cheese made.....	582.7	681.1	481.9	702.6	755.2	687.3	728.2
Pounds of cheese made from 100 lbs. of milk.....	10.18	9.98	12.10	13.05	9.54	13.62	12.03
Pounds of milk to make a lb. of cheese.....	9.82	10.02	8.27	7.66	10.48	7.34	8.31
Pounds of cheese per lb. of fat in milk.....	2.73	2.77	2.63	2.46	2.84	2.43	2.71
Per centage of fat in the cheese.....	36.57	35.95	38.04	40.63	35.24	41.05	36.94
Per centage of casein in cheese.....	23.90	24.20	23.26	22.12	24.50	21.94	23.74
Per centage of water, ash &c., in cheese.....	39.53	39.85	38.70	37.25	40.26	37.06	39.32
Cost of cheese per lb., in cents.....	7.36	7.24	7.78	6.57	6.72	6.62	6.35
Value of cheese made.....	\$56.33	65.84	46.58	67.12	73.00	66.44	70.39
Profit from the cheese.....	5.62	7.00	3.06	13.87	12.82	13.42	15.06

Want of space obliges us to postpone to the next number our observations on this highly interesting table. Mean-while, our readers will doubtless be able to extract therefrom many very useful lessons.
From the French (Signed) EMILIA CASTEL

WHEY BUTTER

Bulletin 85, of Cornell Experiment Station, treats of the process of securing the fat of whey and churning it into butter. The practice was commenced with the purpose of making some investigations as well as to give students practice in running the separators. From whey containing 25 of one per cent. of fat, 257 pounds of butter was made from 1,000 pounds of whey, which shows that practically all the fat that escaped from the cheese was recovered by the separator and churn. The manufacture of whey butter differs from ordinary butter-making in only a few details. The whey had to go through the separator twice; the first time about one-tenth of the whole bulk was taken from the cream outlet, which was found to contain from two to five per cent. of fat, or about the same as normal milk. This so-called first cream was run through the separator a second time, when the cream extracted was about the proper consistency for churning. In all the experiments the whey was run through the separator immediately after it was drawn. At this stage it was warm and slightly acid, therefore in good condition for churning when sufficiently cooled down. The most complete churning was obtained when the churn was started at from 45° to 54° F. In regard to the quality of butter, the Bulletin states that it was sold along with the regular creamery butter at the same price. Good judges, who have seen the two kinds side by side, have been in some cases unable to detect which was made from whey and which from cream. In other cases inferiority in flavor and texture have been noticed in whey butter. (1) Whether or not this product can be made at a profit is the practical question for the factoryman to settle. Not a few factories now have separators, etc., for winter butter-making, which could well be used for extracting and making up the fat from whey. As most factories have the necessary steam power to run a separator, and as the butter might find a home market among the patrons of the factory, the extra equipment and labor does not appear to be much of a barrier to the industry. As the season advances milk becomes richer, and the loss of fat, in many instances, is no small item. The thickly coated whey tanks stand in evidence of this. The careful makers, of course, endeavor to incorporate in their cheese as much as possible of the fat which the milk contains. "Whey Butter," we might add, is no new thing, as some Old Country dairymen are well aware.

BUTTER-MAKING IN SOMERSET.

M. J. F. Hall, landowner, of Sparcombe, near Wells, has been giving evidence before the Royal Commission on Agriculture on butter-making in his district. He stated that he wished to give evidence with regard to the economical produce of milk suited for butter dairying. Butter dairying involved two questions—namely, the production of milk, including not only quantity but quality; and, secondly, the processes of the dairy. He had 180 acres in hand, the stock being 75 head of Jersey cows, of which 40 or more were in milk. He strongly advocated Jerseys against any other

breed, as butter cows, their value as such having been indisputably determined in the 90 days' test at Chicago in 1893, when the Jersey cows in all cases headed the list as butter producers. English-bred Jerseys he considered as hardy as the average English breeds. During the twelve months ending December 31 last the number of Jersey cows in milk on his farm averaged 30. The milk produced and separated was 13,228 gallons, the butter made and sold was 7,373 lb., and the price per pound averaged 15. The butter ratio, or quantity of milk required to make 1 lb. of butter, averaged throughout the year a little less than seven quarts to the pound. (17½ lbs.) The butter value of the milk was 8.9d. throughout the year, and the feeding value of the skim milk 1d. per gallon. The average yield of milk per cow was £15 18s. 9d., of skim milk £2 11s. 9d., the gross total per cow per annum being £18 10s. 6d.

INJURIOUS INSECTS, APRIL, 1895.

After the past hard winter it appears to be of some interest to note anything regarding especial presence or absence of injurious insects which may be now occurring. Up to the last few days (with the exception of warble infestation) insect attacks, so far as they have been reported to me, have been mostly late, and maggots in the young corn (as, for instance, those of the wheat-bull fly) have hardly been mentioned at all, but now common infestations, such as those of wireworms, slugs, apple insects, &c., are being reported in rapid succession.

An attack, of which samples have been sent me (in one instance as being ruinously injurious, but which I have not before known as a really serious infestation, is that of the cabbage root gall maggot, to young "planting out" cabbage. This is the grub of the small blackish weevil beetle, the *Ceutorhynchus sulcicollis*. Commonly the galls can be easily cut or scraped by the nail from the root-stock of the little plants, and there is no need to think more about it; but this year I have found that a large proportion of the plants I was consulted about were quite worthless for planting out.

In a consignment of 2,000, of which samples were sent me, only about 5 per cent. were uninjured, and on those which I examined the galls were so bad that in some instances they were nearly confluent round the root-stock, and the maggots had gnawed so far down into it in the diseased gall tissues that it was "ringed" too deeply for any hope of proper growth. I advised my inquirer to refuse the plants, which he told me he intended to do, as he and his man were certain they would flag off. This attack, though exceedingly common to both cabbage and turnip, is so rarely of any great importance that an observation of it as really mischievous appears to be worth notice.

In this case no good could have been done by any treatment, but commonly, if the plants are in fair order, and something more is needed than just scraping away the galls, an application of some stimulating dressing which would come into action directly, such as nitrate of soda, would probably do all that is requisite.

Whether weevil in broad-bean or Frenche-bean seed is more present than usual I do not know, but inquiry has been coming in about it, and it is a pity that this seed attack is not more attended to as, it lessens the weight of the beans if sold for consumption, and

weakens the first growth of plants from weevily beans used for sowing. It may be quite easily recognised by the beans, from which the little greyish weevils have escaped, having one or more round holes, as if they had been pierced into with a knitting pin. Those where the beetle is still inside have a small round depression in the skin, where the beetle or chrysalis (having gnawed a tunnel while still in the maggot state up to the coat of the seed) is lying just within.

If the beans are still infested, the pests within may be killed by dressing or "pickling" them, much in the same way as with seed wheat, or with various applications (I would with pleasure give details of well-proved methods of treatment), but though this stops recurrence of attack, from these very beetles flying by-and-by to deposit their eggs on the embryo bean pod in the very first stages of its growth, it does us no good about the injured bean seeds now wanted for sowing. In these the fact of more or less of what would have been the seed leaves having been eaten away by the weevil maggot weakens the growth of the young plant at its very commencement, and it would be a great saving to growers if they would examine seed and refuse what is or has been much infested. Such seed can easily be distinguished by the round perforations, or round, rather transparent, small depressions in the skin, and an instance has just now been brought under my notice, through the courtesy of the editor of one of our leading agricultural papers, in which, for want of this simple bit of knowledge, two agriculturists, respectively buyer and seller, were totally at a loss to account for the sudden outburst from what had appeared to be clean seed.

"Red spider" on gooseberry bushes, which was such a serious pest to growers in the spring and early summer of 1893 and 1894, it was hoped might not again trouble us, and it is an attack especially favoured by heat and drought. However, it is still here, though its appearance was late, and its amount of presence afterwards, so far as I have reports, intermittent; this, apparently, being influenced by weather conditions.

On February 22nd, and again on March 9th, careful search on the grounds of one of my special observers showed nothing of its presence, but a week or two after it appeared in great numbers, in widely distant localities, and from one centre of observation I heard, on April 8th, of the pest having been noticed shortly before, in great amount, in coincidence with a succession of hot days. Then it disappeared again.

This intermittence is worth notice in connection with the German observations, sent me last year, of continued presence of moisture stupefying the spiders, so that, though they may recover (if dry circumstances recur in time), otherwise they waste away. Washes of "Kerosene Emulsion," or other forms of wash with a foundation of soft soap, are useful, of which I should be happy to give all requisite information.

The attack of the red bud-caterpillar, the grub of the little moth the *Lampronia rubiella*, which caused such serious loss to raspberry growers in 1891, appears to be so far threatening that it would be well to be on the watch. This is a very small bright-red caterpillar with black head and black spot at the tail. It comes out about this time, or as soon as the raspberry buds are large enough for its accommodation, but as one bud is not

nearly enough for its food it does mischief broadcast. It may eat the heart out of a bud, and then emerge and bury itself in another, or eat away pieces outside successive buds until it finds one to its liking, where it may work down into the pith of the cane, so that infested shoots will fail as if the young leaves were frostbitton.

Breaking off the infested buds gets rid of a deal of grub presence, if care is taken to let them fall into a pail of something sticky, like soft-soap wash and paraffin, otherwise the grubs will rapidly escape and return. We have not, as far as I am aware, any notes of how to kill them in their little white silky cocoons, about one line in diameter, in which (as discovered by Dr. Chapman) they pass the winter, probably in the earth, or at least somewhere about the raspberry stool, but a drenching of the ground and old stumps with any insecticide having a basis of soft-soap (especially "Kerosene Emulsion") would probably do good.

For a dry dressing, dry earth, or ashes or sand or sawdust, in the proportion of a bushel of this to a quart of paraffin, well mixed and well sprinkled on each raspberry stool might stop a deal of grub ascent, and in the above proportion would not be likely to do any harm to the shoots, as at this strength it does no harm to hop shoots coming up through it.

Warble attack appeared early, and good practical attention is being given to the subject in various localities, and more leaflets being needed, I am preparing a new edition of my four-page leaflet (which will begin the hundred and thirty-sixth thousandth) with a few additions to the figures and letter-press, for gratuitous distribution as before.

Also, as the history and habits of the very peculiar horse and (to some degree) cattle fly, the *Hippobosca equina*, commonly known as the "forest fly," early specimens of which are now appearing, are at present the subject of a good deal of inquiry, perhaps I may be allowed to mention that I am preparing a four page leaflet (for distribution as may be wished) with requisite figures and full account of the history and habits of the fly, compiled partly from published authorities and partly from information in my own hands.

The above notes on crop attacks are only just submitted to show some of what are appearing at present, but fuller information would be given to applicants as wished.

ELEANOR A. ORMEROD.

Late Entomologist of the Royal Agricultural Society.

Torrington House,
St. Albans, April 30th.

REPORT OF MM. G. A. GIGAUT AND J. D. LECLAIR

(Continued)

ROTATIONS.

Two kinds of rotations, one for heavy and the other light soil.

For clay land the rotation is as follows:

- 1st. A fallow, of which one-third is used for green fodder, oats, barley, peas and tares.
- 2nd. Wheat.
- 3rd. Two-rowed barley.
- 4th. Mangels, carrots, chicory and potatoes.
- 5th. Six-rowed barley.
- 6th. Oats.

(1) On our family estate, Gloucestershire, the whey-butter sells for half the price of ordinary butter.—Ed.

7th. Meadow and pasture.
8th. Meadow and pasture.

ROTATION FOR LIGHT SOIL.

1st. Fallow.
2nd. Rape or colza.
3rd. Six-rowed barley.
4th. Meadow and pasture.
5th. Meadow and pasture.
6th. Meadow and pasture.
7th. Meadow and pasture.

The fallow is first ploughed in the autumn. In the spring, the manure is spread before the first ploughing if the soil is stiff, but only before the last fall furrow if the soil is light. After each ploughing, in the spring, the soil is harrowed, rolled and worked with different implements. They plough four times in the course of the summer; first ploughing in the month of May; second, in the month of June; third, in July; 4th, in August. About the 8th September they sow the wheat or rye. Sometimes, in summer the cows are stall-fed with green fodder, raised upon the fallow land. The cows graze under the care of two cow-herds.

CULTIVATION OF ROOTS.

The ploughing is done in the fall. In spring, they harrow lengthwise and crosswise several times, and they smooth the land with a wooden implement after broadcast-sowing the artificial manure. The drills are made with an ordinary double mould-board plough, then a light roller with spikes eight inches apart that makes slight holes is passed over them, so as to indicate the places where the seed is to be dropped. The drills are 20 to 22 inches apart. (1)

Mr. Holm prefers sowing the seed by hand rather than with a machine, because often, or almost always, there must be a hoeing before the seed is up, and he is guided in his work by the system he has adopted. The operator, supplied with a small iron spoon, opens the soil at the spot indicated by the marking roller, lets five or six grains drop in and re covers it by casting earth over it by a slight stroke of the spoon. As soon as the mangels appear, they are horse and hand-hoed, the hoe being six inches wide, and then they do the singling.

As soon as they are taken up, the mangels are piled on the field and covered with straw, on which a coating of earth is placed. The top of the pile remains uncovered for a little while so as to allow the mangels to sweat. These heaps are about nine feet wide at the base and four feet high. Among the Danish farmers, the cows remain about 200 days of the year in the house. About thirty years ago, very little milk was produced in winter. The meadows are pastured the first year when they are not promising; otherwise, they are cut and the aftermath is turned to grazing. The present year being most favorable to meadows and pastures, in many places they were able to secure two hay crops, which is not extraordinary, because the land is kept in a state of great fertility. The seed is changed every three or four years.

Mr. Holm has 16 tünde of chicory. The seed cultivation and shipping of which costs 130 kroners (\$35.15) per tünde of land. Last year, this crop gave him 440 kroners (\$18.96) per tünde of land. The chicory is sold at Copenhagen. The success of this crop greatly depends upon the time it is

(1) Too often, in Quebec, the drills are made 30, 34 and even 36 inches apart! A great waste of space.—Ed.

sown; too early or too late, the chicory goes to seed or also fails.

During summer the cows are kept six weeks in the house; at night they are always in doors.

Mr. Holm buys artificial manures for part of his land. The cost of basic slag is 25 kras. per 100 lbs. For mangels or chicory he uses ground bones, which cost 6 kr. per 100 lbs. With the slag he uses a fertilizer containing 50 per cent. of potassium, which costs 8 kr. (\$2.16) per 100 lbs. Nitrate of soda costs 8 kr. (\$2.16) per 100 lbs. (\$43.20 a ton of 2,000 lbs., here \$60.00.)

THE FEEDING OF SWINE.

Clover, tares and oats to the sows in summer; in winter, mangels to the sows and little pigs. The sows are lodged so as to have lots of exercise; without that their young are weak and subject to maladies that kill them in a short time. Mr. Holm raises young pigs in winter and summer, and the sows generally give him five litters in the space of two years. To the pigs that he is fattening he gives cut mangels, barley meal, and wheat meal, but never oatmeal. He sells them when they weigh at least 200 pounds. When they are too fat the price is always lower. The breed is Danish and Yorkshire, crossed. The secret of making pork fit for bacon is to give a varied ration, and not too much of it. In winter you require at least five pounds of barley to make a pound of meat, and in summer a lesser quantity; but as all the milk produced in winter is used, the fattening of pigs even at that season pays. Mr. Holm estimates that twelve pounds of whey is equivalent in nourishment to a pound of barley, and that a pound of barley is not more nourishing than six pounds of skim milk, or four pounds of potatoes, or ten pounds of mangels or carrots. Experiments have shown that to make bacon-pork barley is superior to peas. In no case should Indian corn be given in the month previous to the killing.

THE FEEDING OF HORSES.

In spring, 15 lbs. of oats, barley or rye, a little hay and chaffed straw; in winter 8 to 10 lbs. of carrots, 11 to 12 lbs. of oats, barley or rye; the oats are not ground, but the barley and rye are crushed.

Mr. Holm has a brick cemented liquid-manure tank, which is roofed in; the liquid is spread on the meadows or on the mangels. He considers that the cost of the tank was repaid him in two years by the value of the liquid-manure collected. He cannot understand how a good farmer can be without such a tank. The dimensions of the tank are: 40 feet long, 24 wide and 10 high. The manure is not covered, but is so placed as to escape the water from the eaves; the manure-stance is impermeable; it is floored with stone, as is all the stable yard. The stable flooring is stone, and supplied with gutters to carry the urine to the tank.

SOWING PER TÜNDE (1½ ACRES) OF LAND.

One tünde (3½ bushels) of wheat, per tünde of land, six bushels of oats, one tünde of barley. For the artificial meadows Mr. Holm sows 28 lbs. of grass seeds per tünde of land, as follows: 10 lbs. of red clover, 2 lbs. of white clover, 1 lb. of alsyke, 6 lbs. of timothy, 3 lbs. of orchard-grass, 2 lbs. of rye-grass, 1 lb. of Italian rye-grass, and 3 lbs. of tall oat-grass.

COWS' FEED IN WINTER.

Six to eight lbs. of hay per day, 60 lbs. of mangels, 4 lbs. of cake and 2 lbs. of bran, with ground-grain, and of straw as much as they care for. The herd consists of large cows, from 1100 to 1200 lbs. and includes 120 cows, 86 young animals, and 24 horses.

A tünde of grain weighs about 180 lbs. (1)

In his garden Mr. Holm has a nursery of forest trees. Every year, he makes a compost of waste matters and the cleaning of the ditches. This year, he has 8 tünde of potatoes, 25 of mangels, 3 of carrots, 16 of chicory, 32 of wheat and 36 of oats. He has a swamp that he succeeded in making fertile, by draining it four feet deep, and covering it with a layer 3 inches thick of clay; sand is as good as clay for this purpose. M. Holm says that the price of butter in Denmark was 1 kr. 12 ore (0.30½) during the year ending in the month of November, 1892, and 94 ore (\$0.25) during the year ending November, 1893. He thinks that if sugar beets were raised more extensively, at the same time as mangels, the fallow could be done away with.

Mr. Holm tells us that the highways leading from one large city to another are under control of a superintendent named by the government, and are kept in order by a tax imposed upon the rate-payers of the districts through which they pass. As to the other roads, comprising the frontage roads, they are kept up by the rate-payers of each municipality; each rate payer being obliged to furnish yearly, for the repairing of his road, a certain quantity of gravel and stones. Piles of gravel and stones are to be seen along the roads, which are used wherever a bad spot or rut occurs. The roads there are in excellent condition, and, as M. Holm said, the Danish farmers believe that good public roads are indispensable to agricultural success, above all if it is desired to keep up the dairy business from year's end to year's end, as is done in Denmark. The roads there are always fit for travel, even for heavy loads, except during certain part of the winter, when the snow is six or seven feet deep.

PETER JENSEN, Gaase taft, Kallundborg.

Occupies five tünde of land, equal to 6½ acres. Apart from swine and poultry he keeps four cows, of which one was recently bought, and a horse. He pays an annual rent of 40 kroners (\$10.81), and his taxes to the government and the municipality come up to 39 kroners (\$9.72.)

Eight year Rotation:

1st. Six-rowed barley.
2nd. Rye.
3rd. Mangels and potatoes.
4th. Two-rowed barley.
5th. Rye.
6th. Meadow and pasture.
7th. Meadow and pasture.
8th. Meadow and pasture.

The floor of his shed is beaten clay. As a liquid manure tank he uses a cask sunk in the ground. Last year he had only three cows, that gave him the following quantities of milk, according to the book kept by the butter maker.

(1) But 3½ bushels of wheat would weigh more than the same of barley or oats. J. J. F.

	Milk Furnished.	Money Received.
August, 1893.....	675 lbs.	\$ 6 59
September	406	8 05
October	733	4 47
November	1,403	17 40
December	1,970	22 78
January, 1894.....	1,986	19 63
February.....	1,768	17 41
March	1,586	15 92
April.....	1,819	17 86
May	1,620	13 75
June	1,145	9 86
July.....	696	6 08
	15,807	\$159 80

He received from the factory a higher amount, owing to the percentage of profits made at the end of each year, but that surplus was used to pay for the skimmed milk that he received from the factory. In the course of the same year he sold six pigs for the sum of 200 kroners.

CO-OPERATIVE BUTTER FACTORY OF SPANGSBERG, KALLUNDBORG, KEPT BY JOSEPH PETERSON.

The butter-maker's salary is 2,000 kro. (\$540.75). The patrons number 112 and possess 800 cows. The factory cost 20,000 kro. (\$5,407.50). It receives as much milk in winter as in summer, and is worked every day of the year, even on Sundays. The price of the butter is divided according to the richness of the milk. The maker estimates that each cow of his patrons does not furnish less than 4,000 lbs. of milk per year.

He states that lime-water should not be used to wash the barrels that are to hold the butter. The average amount of milk required to produce a pound of butter varies from 25 to 26 pounds, according to the season; the higher the temperature, the more milk required. The average amount of milk received daily is about 9,000 lbs. The quantity of cream determined upon by Controller Fjord and which serves as a basis for the division of the money, varies from 3.15 o/o to 7 o/o, and gives an average of 4.0 to 5 o/o. The skimmed milk is pasteurised at 158° F. before being returned. They use a No. 2 Danish machine an "Alpha" machine of the latest model. The cream is generally cooled to 50° F. to 53° F.; then half is put into a barrel, or it is allowed to ripen of itself, without any addition of ferment, until evening; it is then mixed with the other half which remained cool, and the whole is set in a place until next day, when the temperature should be 50° F. In cases of bad milk, the cream is heated to 158° F. for a few minutes, and a ferment of skimmed milk and whole milk, prepared 24 hours before, is added thereto. This ferment is prepared by heating it and keeping it at a temperature of 75° F. during 24 hours; it is skimmed, well stirred to break the curd, and the mixture is ready. It appears that the cooked taste of this ferment does not affect the aroma of the butter; this ferment is very strong. The butter is taken from the churn with a sieve and washed in a tub of water by moving the sieve up and down, and then emptied into a can. It is passed seven or eight times through the worker, then sprinkled with salt at the rate of 5 per cent, and is again passed five or six times through the worker, reversing it each time. Then it is taken to be cooled in a box, the bottom of which has a layer of ice under the lattice-work tray that holds the butter and this box is closed by a kind of

pan that contains ice. After two hours it is passed through the worker a dozen times and finally is placed in the cask.

PROPR. PILLE, LONDER KIRKEBY, Nykjöbin.

Extent of land, 75 tønde (100 acres); 30 cows, 30 pigs.

He has five tønde (6½ acres) of sugar beets and two of mangels. He intends next year to double the amount sown to sugar beets.

He estimates the cost at 90 kroners (24.33) of working one tønde (½ acres) of sugar beets, the dung and fertilizer not being included. For the beets he gives a deep ploughing, and on each tønde of land he puts dung, 700 lbs. of super-phosphate, and 300 lbs. of saltpetre (Nitrate of soda?)

ROTATION.

- 1st. Fallow; half whole, and half bastard-fallow.
 - 2nd. Wheat.
 - 3rd. Oats.
 - 4th. Roots, sugar beets, and mangels.
 - 5th. Barley.
 - 6th. Meadow and pasture.
 - 7th. Meadow and pasture.
- Mr. Pille has 22 tønde under meadow and pasture

There is a beet-root sugar factory at Nykjöbin. It works each year from the end of September to Christmas. The farmers receive therefrom an amount of pulp in proportion to the beets that they deliver.

A great number of pear orchards have been set out along the road in that locality: they were loaded with fruit.

10th August, 1894.

CO-OPERATIVE CREAMERY OF FALLESHAALLE, ESKILSTRUP, KEPT BY MÆJERIST ANDERSEN.

Patronized by 332 farmers who keep 1,700 cows

At present an average of 800 pounds of butter per day is there made.

In that establishment they have two Danish machines and a new model Alpha machine. The milk to be skimmed is heated to 79° F., and the cream is immediately cooled to 50° F. As everywhere else, the skimmed milk is kept at 158° F., before being given back to the farmers, who cool it. Ferment is always used in the preparation of the cream. This ferment is prepared the day previous with skimmed milk heated to 70° F., and kept at that temperature during the following 24 hours. This ferment is added to the cream in the proportion of 5 per cent and is allowed to work in the tubs until evening; it is placed in cans in a reservoir of water where the cream can take a temperature suitable for churning. Cold water is added before the end of the churning and the movement is stopped when the grains are very small. The butter that floats is collected with a sieve or strainer and is carried at once to the manipulating table where it gets several turns in order to drain it. It is then placed in a trough for salting, in a proportion of 4 per cent., which is done by kneading the butter by hand; replaced on the roller for 4 minutes, the salting is completed, and the butter is at once put into tubs. All the manipulations are with bare hands. For a pound of butter the same quantity of milk as elsewhere is required. The butter we tried had a little too much of the ferment taste. The buttermilk is always placed in a special vat

CO-OPERATIVE CREAMERY OF HJORTEBJERY, NYHKJÖBING, KEPT BY THE BUTTER-MAKER LARSEN.

126 patrons. Larsen receives every day about 16,000 pounds of milk. In a competition he received a gold medal for his butter. During the year 1893 he received the following quantities of milk:—

	Milk received.	Butter.	Quantity of milk per lb. of butter.
1893			
July	477,055	17,659	
August	454,564	17,227	
September	388,440	15,580	
October	360,202	14,219	29 3/10
November	370,528	14,113	26 2/10
December	411,975	15,486	26 5/10
1894			
January	439,688	16,340	26 9/10
February	426,718	15,829	27
March	493,345	18,036	27 3/10
April	504,321	18,166	27 7/10
May	579,270	20,979	27 6/10
June	529,240	18,936	

In this factory there are three separators, two Danish, and one Laval, latest model. The milk is heated to 176° F.; the cream is immediately cooled to 53° F. The skimmed milk is returned pasteurised to the farmers. The cream is matured by means of a butter-milk ferment, in the proportion of 8 per cent. This ferment is used without being renewed during eight days. After eight days it is renewed by means of a milk ferment, (*ferment lactique propagé*) and every second month that ferment is renewed by a "pure culture" in a dry state. This latter, in solid form, is considered better than that presented in liquid form, and the return made to the makers is always accompanied with an explanation of how to make the ferment. The cream is churned at a temperature of 50° F., and the churning is stopped when the butter is in small grains. Then, a certain amount of cold water is added in the churn, the butter is taken out with a sieve, and is placed in a trough where the draining begins. It is given a few turns on the roller, and is salted on the manipulator in the proportion of 3½ per cent. A first mixing is made by a few turns of the roller, and it is left in an ice-box to rest until next day. It is then rolled again for a few minutes. The cows give an average of 5,000 lbs. of milk per year.

CO-OPERATIVE CREAMERY OF PONDERBY, EBBYRUP, KEPT BY MISS SYRE DAMGAARD.

The butter is sold at 83 ores per pound. Every day about 200 pounds of butter is made. According to the books of this establishment the following quantities of milk have been received:

	Milk received.	Butter.	Pounds of milk per lb. of butter.
1894			
January	204,048	7,613	26 7/10
February	189,184	6,908	27 4/10
March	198,272	7,187	27 6/10
April	176,591	6,319	27 9/10
May	208,530	7,866	26 5/20
June	208,391	7,602	27 4/10
July	178,165	7,727	26 5/10
1 August	5,383	205	26 3/10
8 August	5,550	221	24 7/10

The milk is received twice daily; that of the evening is kept at the factory in a cold place to be skimmed with that of the morning when heated to 75° c. The skimmed milk is returned pasteurised to the farmers. The cream is also pasteurised at 158° F. and cooled in a refrigerator to 54° F. by gliding in a tiny steam on the outside of a vessel of cold water. It is reheated to 65° F. and receives 4 per cent of skimmed milk ferment, pasteurised, and a sharper acid is added, called "Bluenfeld and Toedo Liquid." This cream is recooled to 50° F. for churning. The butter, taken from the churn with a sieve, is put into a tub of cold water, and then taken with the same sieve to the worker, where it gets several turns to drain it. Next, 3 per cent of salt is added to the butter and it is rolled for two minutes. It is then put into an ice box, where it remains an hour, and is again rolled. Replaced on the worker to receive three revolutions thereof, it is returned to the ice box to remain until next morning. It is then worked for the last time for 3 or 4 minutes and placed in firkins. This butter may be styled "half-salted." By this method the flavor of the butter is almost uniform throughout the year. The improvement is especially perceptible in the autumn. They do not touch the butter with the hands.

MR. A. NYHOLN, TAMESTRUP, SKANDERBORG.

Extent of farm 400 tønde (534 acres), 101 cows, 20 horses, 16 sheep, pigs.

ROTATION.

- 1st. Fallow.
- 2nd. Wheat.
- 3rd. Barley.
- 4th. Oats, potatoes, root, mangels.
- 5th. Oats.
- 6th. Meadow and pasture.
- 7th. Meadow and pasture.

YIELD.

- 3,600 lbs. of wheat per tønde (1½ acre).
- 3,000 lbs. of barley per tønde.
- 3,000 lbs. of rye. "
- 3,000 of oats. "
- 4,000 lbs. of hay. "

The cows give an average of 4,000 lbs. of milk each a year. They are mostly of the Jutland breed.

The cow-yard is paved. The manure, while not covered, is placed away from the eaves. The liquid manure from the cow-house and the manure pile is collected in a tank.

THE FEEDING OF PIGS.

Barley meal, milk; in summer, grass; in winter, mangels.

The cows calve from November to July, ½ in autumn and winter and ¼ in the spring time.

For the meadows, Mr. Nyholn, sows with his oats 24 lbs. of grass-seeds per tønde (1½ acre) of land, including amongst others:—

- 8 pounds of red clover.
- 2 " white clover.
- 3 " alsyke.
- 3 " rye-grass. (1)
- 3 " orchard-grass.
- 3 " timothy.

The Jutland breed of horses sell at 500 to 1,000 kr. (\$136.20 to \$270.40); the first class stallions go up to 20,000 kr. (\$5,407.40).

(1) If perennial rye-grass succeeds in Denmark, it surely should succeed in Canada. E.B.

JENS ANDERSEN, TELEBUR, SKANDERBORG.

The extent of land is 70 tønde (93½ acres.)

He possesses 18 cows, 10 calves, 11 horses, 6 sheep, 20 pigs. Amongst the horses are two Jutland stallions, of which one is five years old, weighing 1,500 lbs., and valued at 20,000 kr. (\$5,407.40); the other, aged two years, weighs 1,400 lbs., and is valued at 12,000 kr. (\$3,244.15). The older stallion belongs to a farmers' association composed of ninety members; both these horses are dark chestnut. Mr. Andersen generally sells three foals each year, at the age of four months, for 1,000 kr. (\$297.40) each. The ordinary price is only 200 kr. (\$54.08). Most of his cows calve in October and November; they are tethered when at grass; they give an average of 6,000 lbs. of milk per year.

ROTATION.

- 1st. Fallow.
 - 2nd. Rye.
 - 3rd. Barley.
 - 4th. Oats.
 - 5th. Oats, mangels and roots.
 - 6th. Meadow and pasture.
 - 7th. Meadow and pasture.
 - 8th. Meadow, pasture and oats.
- There are four tønde of land (5½ acres) under mangels and carrots; the mangels are given to the pigs and cows.
- The pigs are fed on milk and barley meal; in summer, barley and clover and, in winter, 2 or 3 lbs. of beets. The horses get chaffed straw and grain; in winter they get, in addition, 8 or 10 lbs. of carrots a day each.

VISIT TO MR. QUIST'S CREAMERY AT SKANDERBORG.

This factory is one of the best supplied with utensils that we have visited in Denmark. It is amply provided with ventilation, and is supplied with appliances to pasteurise the milk before skimming, and to cool the cream by pouring it freely in the open air on a machine filled with ice.

The cream is always ripened by means of a prepared lactic ferment; but, Mr. Quist, who is a distinguished chemist, prepares these pure cultures himself, and uses them daily. He, however, is of opinion that the ferments are only necessary when milk is not of superior quality, either on account of having been exposed to a foul atmosphere, or that the cows have received food that, more or less, communicated its flavor to the milk.

The cream is churned at a temperature of 50° F. A little water is generally added at the end of the churning, so as to facilitate the gathering and the separation of the buttermilk. The butter is taken out with a sieve and carried to a trough, where it is left some minutes to drain. Thence, it is taken to the worker to be purged of the greater part of the buttermilk, by running it under the mechanical roller. It is salted at the rate of 4 oyo is mixed by a few more turns under the roller, and is then allowed to remain until the following day in an ice box. The operation is repeated for three minutes, and the butter is then put into firkins for shipment. If it happens that the cream is not cold enough at the churning time, or is too warm when the butter comes, it is washed by a to-and-fro movement of the sieve containing it in a tub of cold water.

We remarked at this factory a receiving basin mounted on a weighing machine that is balanced on two pivots, by means of which a great deal of milk can be emptied in a short time.

In the lactic ferment of Mr. Quist, there is sugar of milk, 4 grn.; *peptonum siccum*, 1 grn.; *phosph. calcicus*, 1 grn.; *aqua*, 100 grns.; *neutralized med. carbo. calc.*

The milk pasteurised for butter is heated for a moment to 167° F., whilst, to prepare the ferment, it is kept at that temperature for an hour. The butter should only contain 12 to 13 o/o of water; when it contains more, it is due to the fact that the cream is not properly fermented, or that the butter was churned too rapidly, or at a temperature too high or too low.

According to the books of the establishment, the following quantities of milk were received on the days mentioned:

Date	lbs. of milk.	lbs. of butter.	lbs. of milk per lb. of butter.
1893			
August 31	12,990	495	26.8
Sept. 30	8,613	321	25.3
October 31	5,695	210	24.6
Nov. 30	7,387	271	25.6
Dec. 31	7,245	247	28.6
1894			
Jan. 31	8,914	318	27.0
Feb. 28	9,378	313	28.7
March 31	11,213	370	28.9
April 30	12,611	435	28.2
May 31	17,001	629	26.1
June 30	16,954	592	22.5
July	14,918	542	26.0

Mr. Quist keeps a great many pigs, of the Yorkshire and Danish breeds crossed. He says that the pure Yorkshire is not what is needed for bacon; he sells his pigs for 30 ores per lb. = about 7 cents. (1)

Being asked as to the effects of casein ferments on the flavor of the butter, he would not recommend them; on the contrary, he advises to skim with a percentage of cream at a maximum of 10 to 15 per cent. The establishment uses two Danish machines, and one Laval Alpha new model.

30 August, 1894.

A VISIT TO THE DAIRY KEPT BY MR. BUSCK, COPENHAGEN, DENMARK.

This establishment was founded for the purpose of supplying milk to the city of Copenhagen.

Butter is also made there and distributed to customers at the same time as the milk. The greatest care is taken to supply the public with clean, pure and healthy milk.

Cream is also collected for sale. The cows whose milk is sold to this establishment are examined every fifteen days by veterinary surgeons paid by the company, the soul of which is Mr. Busck.

The milk is in great part furnished by farmers living at great distances from Copenhagen, some even at eighty miles from the city. Each of these farmers is obliged to cool the milk to at least 50° F. before putting it on the train that carries it in refrigerators supplied by the company.

This milk is distributed in sealed bottles, and in cans so arranged as to

(1) 100 ores = 1 kroner = about 25 cts. — Ed.

give to each customer milk of equal richness in cream to the others.

The company daily receives 50,000 lbs. of milk.

The milk received and not sold is heated to 90° F. and placed in cans standing in vats of ice water. This milk is skimmed next day; the cream collected is ripened at a temperature of 60° F., and churned the next morning after having been cooled to 50° F. in a Lawrence refrigerator.

The butter comes in 30 minutes. It is taken from the churn with a sieve and is immediately placed in a trough, where it begins to drain. An employé kneads it with bare hands, so as to drive out the buttermilk. It is then put on the roller for a minute and returned to the trough, where it gets the necessary quantity of salt for the customers for whom it is intended. The salt is first incorporated by a second kneading, and the mixing is continued with the roller for another minute.

Thence, the butter is carried to an ice-box on small, thin, re-curved palettes, leaving a large surface exposed to the cold air. After an hour it gets another working of a minute on the roller, and is carried back and placed in the same way in the ice-box, where it remains for an hour. After that time has elapsed, the butter is again brought under the roller, and it receives its last working for a couple of minutes.

The butter is then put into little earthenware pots and distributed to the customers. In washing the vessels used for milk or butter, the first rinsing is with lukewarm water, then with boiling water, with which soda is mixed. The vessels are then rinsed in clear limewater, put under dry steam, and left to dry.

The unsold cream is brought back to the factory and is used to make a second-quality butter, which is worked in exactly the same way.

The milk intended for children has water and sugar added in proportions varying according to the ages of the children. It is bottled and pasteurised by putting the bottles into water heated to 185° F., and then cooled for delivery.

The heating and cooling are, of course, done gradually.

When the milk reaches the establishment, it is immediately filtered through three layers of sterilised gravel freed, by means of a riddle, from all impurities caught or received.

The company never accepts the milk from a farmer who has any contagious disease in his family, or when the cows are affected with tuberculosis or other diseases. A child never gets the milk of a cow until twelve days have elapsed since the calving, or the milk of a cow that approaches the end of her milking period.

(To be continued)

NORFOLK FIELD EXPERIMENTS.

A meeting of the Norfolk Chamber of Agriculture was held on Saturday week in the Board Room of the Agricultural Hall, Norwich, Mr. J. S. Holmes presiding, for the purpose of receiving and discussing the report of the Agricultural Experiments Committee for 1894. The report was presented in pamphlet form, containing a great number of tabulated results of the experiments. The report contains the following passages:—

This is the second year of the trial of varieties of wheat on the Florden

clay and since the result of the two years are so much at variance, no reliable conclusion can be drawn without further repetition. Hybrid King and Scholey's Squarehead, which last year gave the first and second highest yields, are this year at the bottom of the list, while Stand-up and Windsor Forest have changed places in the opposite direction—last year they were bottom, this year they are second and third respectively. Holborn Wonder, Hundredfold, and Banham's, are much as last year. The only variety that has done uniformly well both years is Squarehead's Master, which was second last year, and this year comes out easily first. This variety seems to do well on most soils and in very different seasons, having been always high up the list wherever the experiments have been tried. The reason of the divergence in the two years' results is obvious; 1893 was an extremely dry, 1894 a forcing season. This serves to bring out the necessity of repetition of experiments, so as to strike a fair average, and do away with the effects of any peculiar season. The varieties of barley experiments were continued at Bolwick for the third year, and those at Whitlingham having ceased, a new set was started at Warham. At Bolwick the points to notice are the improved position of Hallet's, which this year produced the largest crop; the uniformly large yield of Archer's, which every year has come out either first or second; and the failure of Goldthorpe, which has done very badly each year at Bolwick, though yielding a large crop and a good sample at Whitlingham. At Warham the crops all round were poor, Archer's yielding the largest. Next in order come Golden Grain, Yorkshire, Hallet's Kinver Chevalier, Goldthorpe, and Oakshots. Another set of manurial experiments on barley was this year successfully conducted on the light chalky land at Warham. The results of these experiments year after year have been singularly concordant, and this year's experiments are no exception. Again, we notice that salt has produced an appreciable effect on the yield of barley, either when used alone, or in conjunction with nitrate of soda. The results with potash, either (1) alone or in a mixture, are extremely small, at most 3 bushels per acre, and that in only once case. On plot 14 1 cwt. of muriate of potash was tried in order to test if the enormous effect found by Mr. F. I. Cooke on the chalk at Flitcham, from the addition of potash, is common to all chalk soils. The results show that it is not, and that barley requires no potash on the chalk soils at Warham. Superphosphate alone on plot 10 has produced no increase at all; in fact, plot 10 is rather below the average of the unmanured plots, and from a comparison of plots 2 and 5, and plots 4 and 7, its effect in a mixture appears to be very small. We may conclude, therefore, as last year, that minerals produce but little increase in the barley crops under ordinary conditions. Nitrogen, on the other hand, as on all former occasions, has produced a very considerable increase—1 cwt. of nitrate of soda on plot 5 giving 8½ bushels per acre more than the average yield of the unmanured plots—and, to put it another way, no plot which received either nitrate or sulphate of ammonia yielded less than 7 bushels per acre more than the average of the unmanured plots. With regard to the quantity of nitrate, plot 5, with

(1) The use of potash is quite a problem, and needs solution. As a rule, it is useless on heavy land, and almost useless on well farmed light land.—Ed.

only 1 cwt., gave within half-a-bushel as much as plot 11 with 1½ cwt. It would appear, therefore, that 1 cwt. is quite sufficient, at any rate when applied alone. Comparing plots 3 and 4, the larger dressing of nitrate, 2 cwt. per acre, has produced an increase of 5 bushels per acre. This result apparently contradicts that of plots 5 and 11, noticed above; but the reason of the discrepancy probably is that, with the larger dressing of nitrate, the minerals in the soil are not sufficient, and the increased facility afforded to the crop of absorbing nitrogen must be balanced by the addition of minerals, in order that the full effect might be produced. The question arises. Is the extra increase of lots 3 over plot 5 worth the outlay for 2 cwt. superphosphate, 1 cwt. potash and 1 cwt. nitrate? Probably in most cases, the 1 cwt. of nitrate per acre would be most economical dressing. With regard to the best form in which to apply nitrogen, on comparing plots 3 and 4 with plots 8 and 9, it will be seen that nitrate of soda has this year a very distinct advantage over sulphate of ammonia, and this result is exactly what was observed last year. The barleys from the different plots are being analysed, in order to study the effect of the various manures on the composition of the grain. The rotation experiment at Bolwick has now come to the end of its fifth year. Last year the wheat, after seeds, was little, if any, better on the plots which received dung in 1889, than on the fish salt and nitrate plots. It was suggested that this might be due to the recuperative power of the seeds, and that by growing a crop of oats after the wheat the residue of the dung, if any, would be made more apparent. The result has been as expected: taking averages of similar plots we get, fish salt and nitrate, 70 bushels per acre; no manure, 70.62; 20 loads dung, 94.45 bushels; and 10 loads dung, 88.75 bushels. These results show that the unexhausted residue from salt and nitrate is nothing, and that from dung it is considerable, much more than was indicated by last year's wheat crop. The plan of manuring in these experiments was rather different this year. Basic slag was not tried, and muriate of potash was used to mix with the superphosphate, &c. Taking the average of similarly-manured plots, there is very little difference between those that received manure, and all yielded about two tons per acre more roots than unmanured plots. The actual averages are—No manure, 6 tons 9 cwt.; superphosphate, 8 tons 5 cwt.; superphosphate, potash, and nitrate, 8 tons 1 cwt.; superphosphate, potash and ammonia, 8 tons 7 cwt.; superphosphate and guano, 8 tons 12 cwt.; dissolved bones, 8 tons 12 cwt. The highest yield was produced by superphosphate and guano, and by dissolved bones, but only 7 cwt. per acre more than was produced by superphosphate alone. This 7 cwt. of roots would certainly not pay for the additional guano, or make up for the higher price paid for the dissolved bones. The addition of potash and either ammonia or nitrate to the superphosphate has not this year been a success. The land evidently is not deficient in potash.

NOTES AND NOTICES.

JAMES JOHNSTON'S STOCK FARM.

The Ayrshire Stock Farm of James Johnston, Come, P.Q., is situated about thirty miles west of Montreal. The herd of about twenty animals is headed by the imported bull Prince Henry, sired by the noted bull Traveller, with many typical Ayrshire points. Among the females Nellie Barcheskie is sel-

dom equal to, being the Queen's Jubilee heifer at the Royal England. She has a so very successful in Canada, and is an A 1 dairy cow. No. 1 May Blossom (imp.) a very large and successful show cow, is also an excellent breeder. Maud, bred by the late Thos. Brown, of Petite-Côte, is a cow of extra dairy quality, and a good show animal. Yellow Bess (imp.) was a first prize cow in Scotland at Kilmarnock and other shows, which guarantees her superiority. Brown Berry, bred by R. Osborne, of Wyndholm, Scotland, a successful show cow in her native land, is quite neat enough, but does fairly well at the fair. If the present young stock is any indication of those which are to follow them, Mr. Johnston will in a very few years own a large herd of extraordinary Ayrshires.

HOW AND WHEN TO STRAY.—Messrs. Stone & Wellington of the Fonthill Nurseries, have prepared a circular giving the fullest information and instructions for properly spraying fruit trees, plants, etc., and for the benefit of Farmers and Fruit Growers in the Province of Quebec, will send copies free to all applying to J. W. Beall, Manager, Temple Building, Montreal.

BUTTER AND CHEESE MAKERS

Might as well expect to catch birds by applying salt to their little tails as to expect to make good cheese or butter with cheap, impure, common salt. It is now an axiom among progressive dairymen, that It pays to use the best salt.

Windsor Salt

is known to be the purest and most wholesome salt that can be found anywhere.

Windsor Salt Works, - Windsor, Ont. 6-95-121

WANTED.

A GOOD MAN IN YOUR DISTRICT to represent the Fonthill Nurseries of Canada. - 7 or 700 acres. The largest in the Dominion. Position PERMANENT.

Salary or commission to right man. With the increasing demand for fruit, a position with us as salesman will pay you better than engaging in farm work. Send us your application and we will let you how to earn good money. School Teachers it is just the thing for you during the summer. Write for particulars.

STONE & WELLINGTON.

J. W. Beall, Manager, MONTREAL. Mention this paper. 6-95-31

J.G. MAIR

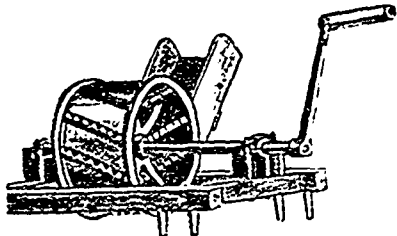
BREEDER AND IMPORTER OF IMPROVED YORKSHIRE HOGS



My herd is one of the Best and is headed by two Imported Boars. I furnish Registered Pigs with all stock. I sell and ship nothing but the best. Write for prices, or come

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This machine is the most perfect on the market. A man can use it with one hand as easily, and make with it more work, than two men could do with any other machine, without any curd undivided. The Crank and the Hopper being so close together at hand one man alone can put the machine in motion. These points render it advantageous to all factories. In some factories where there is ordinarily but one man employed, this machine gives him the power to cut the curd, undivided, and, on the contrary, in others it is quite sufficient for the whole work. Each machine guaranteed to have all the qualities claimed in this advertisement. Ask for prices.

J. A. GOSSELIN, DRUMMONDVILLE, QUE.

Manufacturer of Cheese-Dairy Supplies 6-95-91

AYRSHIRES FOR SALE.

Young stock of both sexes, bred by Silver King 6891, and Champion of Baruch 6302, for sale at reasonable prices. Write for prices or call and see my stock B. DRUMMOND, JR., 6-95-12 Petite Côte, P.Q., near Montreal.

WOVEN WIRE FENCE
Why pay 60 to 80 a rod for fence when you can make the best Woven Wire Fence on earth, horse high, built strong, pig and chicken tight, for **13 to 20c. A ROD?** A man and boy can make from 40 to 60 rods a day. Over 100 different styles Catalogue free. Address, **KITZELMAN BROS.,** Ridgeway, Indiana.

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The most simple. The most durable. The most effective. It is easy to keep clean.

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Ayrshires. Ayrshires.

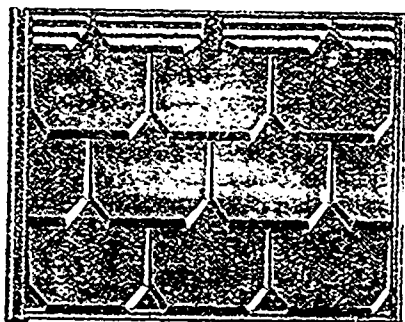
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MILK, BUTTER and PRIZE record dairy strains, procurable in Scotland. Never have higher prices been paid for Ayrshires than I have paid. They are without doubt the most noted heads in Canada or United States, and stand second to none in Scotland. Make it your special business to write for more and fuller particulars. Still better, come and see stock. Choice Collie Dogs from imported stock.

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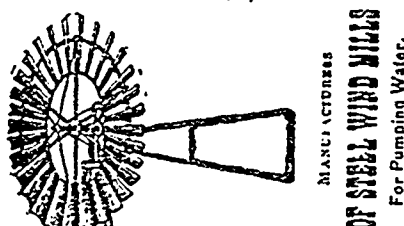
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—A1.— **POWER MILLS**

For driving machinery. 4 corner angle steel towers any height.

Iron Pumps, Iron and Brass Cylinders, and all kinds of Fittings

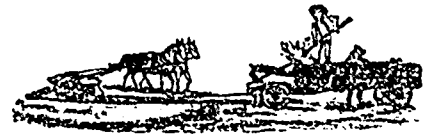
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Crushers, etc. Cut descriptive circulars and estimates on application. Good responsible AGENTS WANTED in the Province. of Quebec. 6-95-121

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Patent, June 1891 & November 1894

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The ONLY one which you can fix without taking off the front wheels.

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HAND WORKED CENTRIFUGAL CREAM SEPARATORS

— For Farms of 10 to 50 Cows. —

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In order to introduce our machines in all the parts of the Province, for all orders accompanied with the price of the machine, received before the 1st of January, 1896, we will give the following exceptional prices:—

- Hand worked Alexandra Cream Separator No. 8—10 to 25 cows—Special Price, \$800.00. Ordinary Price, \$1100.00.
- Hand worked Alexandra Cream Separator No. 7—25 to 50 cows—Special Price, \$1250.00. Ordinary Price, \$1500.00.
- Hand worked Cream Separator new patent—25 to 40 cows—Special Price—\$1150.00. Ordinary Price, \$1300.00.

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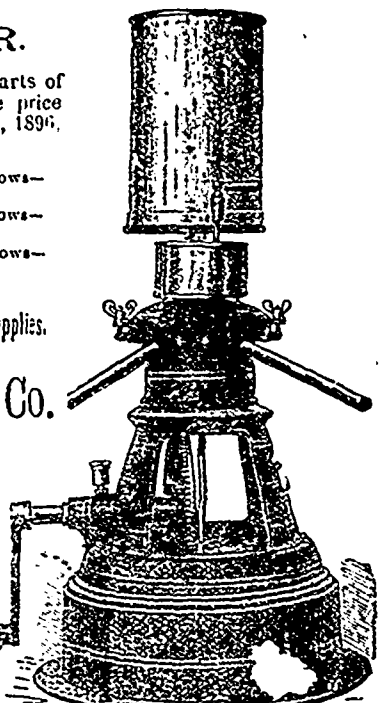
9 ST. ANTOINE STREET,

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6-95-121



THE DURAND FIRE EXTINGUISHER

MANUFACTURED BY

The Canadian Extinguisher Co'y

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Is pre-eminently the most effective Fire Extinguisher ever placed before the public. It will immediately arrest the progress of a severe fire. It is easy to handle and operate, a child can use it as well as a grown up person, and they should be in every household.

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- C. & N. Vallée, St. James Hotel, opp. Nonaven-ture Depot.
- Ferd. Mailhot, St. Jean Deschallons.

- Pelouquin Hotel, Sault-au-Roccollet.
- F. H. Dubuc, of Dubuc, Desautels & Co., 1513 St. Catherine Street.
- Albert Jetté, upholsterer, 1243 Ontario Street.
- John Millen & Son, 1525 St. Catherine Street.
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All of whom give certificates of their excellent working. By providing your premises with a sufficient quantity of Durand Extinguishers you may lower the cost of your insurances. The Company also manufactures Extinguishers of larger sizes, 3 and 5 gal. o.s., especially for the use of Fire Departments of cities, villages and municipalities to take the place of ladders or other apparatus of that kind. The Montreal Fire Department have already purchased 12 of the 5 gallons size. For Prices, &c., add rest.

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Imported American and English strains.

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with Patent Gas Vent.
Best Churn in the Market.

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Stock of all ages and excellent breeding for sale lot of choice Tamworths on hand.
Write us for prices; satisfaction guaranteed.
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It will Save Many Dollars in Time and Trouble if you buy a
CHATHAM FANNING MILL
With Bagging Attachment.
It Cleans Alsike Clover to Perfection; also Marrowfat and Black Eye Peas.

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More than have been sold by all the other factories in Canada put together and doubled.

I have this day bought from M. Michel Lesage, agent for Mr. Manson Campbell, a Fanning Mill with bagging attachment. I have well tested it and am convinced that it will give full satisfaction to all those who will have the advantage of using it.
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Louisville, 3rd October, 1894.
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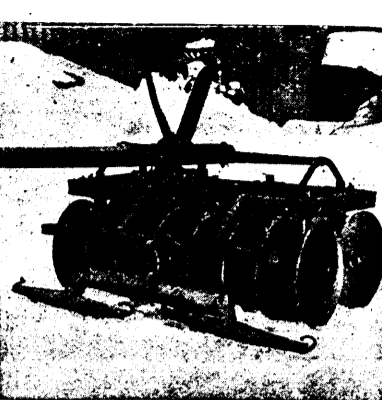
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Seeds of the very best qualities suitable to our soil and climate.
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Cheese, Butter, Calves.

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E. M. YORK.
Belrock, Nov. 27th, 1894.

REPORT CONFIRMED.
We are the cheese manufacturers to whom the milk from the cows above referred to by E. M. York, Esq., was delivered. We have examined our books and find the above reported differences correct.
VANLUVEN BROS.
Moscow, Nov. 27th, 1894.

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YORKSHIRE PIGS and HOLSTEIN CATTLE.

We breed the best. Sell Cheap and guarantee satisfaction. We send Pigs to Farmers' Clubs and Agricultural Societies before we ask any pay, if they suit, send us the money, if not send us the pig. Write for prices.
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Having two stock bulls, I will sell either of them. First-class animals. Good stock getters.
Yorkshire Boars fit for service, sows in farrow and a grand lot of Spring pigs.
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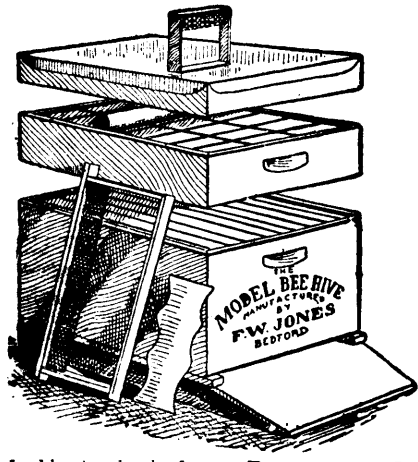
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Bee-keeping may be made very profitable by adopting the modern system. I make a **specialty** of the manufacture and sale of all kinds of **bee-keepers' supplies**. Largest stock and best goods at moderate prices. **Improved Model Bee-Hive.** See illustration showing it arranged for comb-honey raising. Takes the standard Langstroth frame, 9 to hive and regular 4; inch sections. There is no better hive made for the raising of either comb or extracted honey. It is simple, practical and especially adapted to this Province. It is superseding all other kinds wherever introduced. **Sections**, all sizes, very white and smooth. **Comb Foundation, Improved Clark Smokers**, very good, full directions with each, 75 cents with goods, or \$1.00 by mail; **Honey Extractors**, all kinds, **Perforated Metal, Italian Bees and Queens, Comb Foundation Machines, Bee Vests, Rubber Gloves, Bee Books and Journals, &c.** In fact everything required by the bee-keeper for the successful production of honey either for market or home use. Everyone interested in Bees and Honey should send for my large **Illustrated Catalogue and Price List**, fully describing all my goods; sent free upon request. Reliable agents wanted in unrepresented districts. I will



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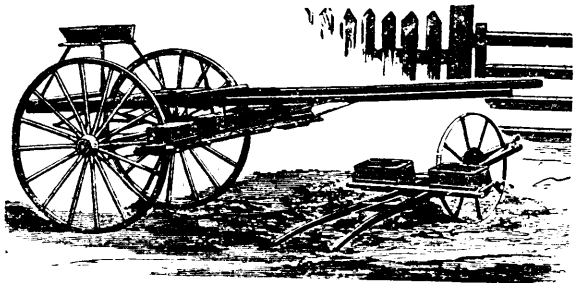
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always taken the lead, they are of large size, and of good milking strains.

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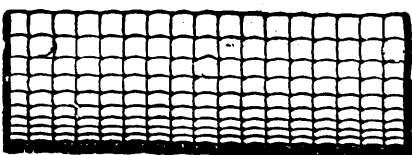
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"Do you see that corn yonder?" said the ass.
"Yes, we can see it but we cannot get at it," said the horse, "for there is the

PAGE COILED SPRING FENCE



between the corn and us and I cannot reach over it."
"And I cannot break through it," said the bull.
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If you want to learn what farmers say about the Page fence, write to **The Page Wire Fence Co., of Ontario, Ltd.,** Walkerville, Ont. 09

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Carriage and Draft Horses
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We are still breeding **DEEP MILKING SHORT HORNS, CHESTER WHITE PIGS**, from Ohio Stock, **SHROPSHIRE SHEEP** from imported stock.

A choice lot of young Bulls, Sheep and Pigs for sale.
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SUPERPHOSPHATES

Rich in AVAILABLE Phosphoric Acid.

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The "B. d'or" brand Rennet Extract, Cheese & Butter Coloring

Also for the renowned "Empire State" Milk Can.

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