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THE JOURNAL of AGRICULTURE. ILLUSTRATED

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Meeting of the "Société Laitière".

From all I hear, the meeting of this society went off very pleasantly. I say, from what I hear, for, though present, for a short time, the fatigue of a very long and interrupted journey prevented me from taking any part in the proceedings, though I had fully intended to do so. The chief point of discussion seemed to be whether cheese made after the Jocelyn system should be sent to the Colonial Exhibition in London or not. After much question, it was finally decided that "creamery-cheese" should be admitted to the competition. Several gentlemen having read papers on various subjects connected with agriculture, the Hon. Dr. Ross addressed the meeting. The premier, after observing how gratifying it was to him to see the deep interest taken by the French Canadian farmers in the objects of the society, spoke of the Canadian cow in the highest terms of appreciation, in its native purity of blood it was worth preserving, as it would answer every purpose in dairying, but in breeding horses, we must look up to the Norman and Percheron blood to improve our own stock. Our mutton would also be benefited by a judicious selection of sheep of the well known breeds. The whole range of agricultural practice was comprehensive, and every department should be cultivated in harmony with the rest: the farmer should treat the spreading of a load of manure with as much thought and attention as he would devote to the sowing and harrowing of a piece of wheat, or the manipulation of a churnful of cream.

A. R. J. F.

GUERNSEY CATTLE.

Extract from a letter received some time ago:

"I mailed you last week the photograph of the first-prize ox at our fat cattle show held last December. He was nine years and six months old, and had been worked on the farm up to six months prior to his death.

	feet	inches
Length from head to hind quarters	9	0
Height	5	6
Width across loins	2	7
Girth round loins	8	6
	lbs	
Weight-alive	2297	
" of four quarters	1455	
" of suet	222	
" of hide	126	

Nearly 69 % of meat and hide!"

I append certain remarks on the breed of Guernsey cattle, taken from the Rural New Yorker, of April 3rd.

A. R. J. F.

While there are few phenomenal butter makers among Guerneys it is contended that there are proportionately much fewer poor Guerneys than Jerseys. In contrasting the two breeds, the enthusiastic patrons of the latter claim, however, a greater quantity, a higher quality and a better flavor of butter, also that it is firmer in summer and of finer grain

the year round; and that the Guernsey butter is oily. The Guernsey men contend that the butter of their favorites is quite as great in quantity, as good in quality and (to put it mildly) as firm in warm weather as that of their more fashionable rivals, and that the Guernsey holds out in milking quite as long as the Jersey, while it is conceded that both her milk and butter products are of much higher color.

There is abundance of room and use in this country for all the good specimens of both of these fine breeds of dairy cattle, and there is neither sense nor policy in disparaging either by way of puffing the other. The Jerseys, of which there are now among us probably from 35,000 to 45,000 pure-bred animals, of which not over half are registered, have done a great deal for the American dairy, not only by contributing their own rich milk and choice butter, but, still more, by improving the products of the native dairy stock by grading it up. The Guernsey is equally valuable for both these purposes, and being coarser and hardier, is adapted to a wider range of country, being able to thrive in a climate too rigorous for the more delicate Jersey. The former has never been subjected to the coddling and petting enjoyed by the latter at home and elsewhere, nor has its constitution or milk capacity been tampered with by breeding to suit the whims of fashion, or feeding for phenomenal butter yields. The Guernsey cows are larger and hardier and more docile than the Jerseys, and the bulls are much less vicious and dangerous; while the calves are larger and can be more readily turned into veal. As to colors, those of the Jerseys are mostly light red or fawn, and black mixed and splashed with white, and "solid" colors are prefered as indicative of the most careful breeding; those of the Guernseys include white, red and black in any shade and mixture, except roan, no instance of which has ever occurred in pure-bred animals. Brindle is not uncommon, and the nose may be either black or white. As a rule, the Guernseys are lighter-colored than the Jerseys.

What on earth does Mr. J. Sibley mean by saying that on a feed of 350 lbs. of corn-meal a Jersey cow (dry) increased 200 lbs. live weight in 8 weeks? And, again, Mr. Webster states that his Jersey cow, Landow's Fancy, gave on 1st January last, 12 lbs. 6 ozs. of milk, from which were made 3 lbs. 1 oz. of butter; and January 23rd, 9 lbs. 4½ oz. of milk, and 2 lbs. 10¾ oz. of butter, i. e., a pound of butter from 4¼ lbs. of milk? Rather too strong, this.

A. R. J. F.

DE OMNIBUS REBUS.

March 29th, Box 23. Sorel, P. Q.

School-farms.—"It is a disgrace to a great State," says the Philadelphia Press, "to insist that experimental farms must be run for a profit. This penny-wise and pound-foolish policy has been tried at many agricultural colleges, with the result of clearing the colleges both of students and influence."

Model-farms are, or ought to be, experimental farms, and most useful establishments they are, but school-farms are quite a different thing, and should be kept entirely separate from the former class. It seems to be a favourite notion with some writers on farming that one of the best institutions in which a young man can learn farming is an experimental farm, and they go the length of proposing that all the field work should be conducted by the pupils. A very slight consideration of the objects for which an experimental farm is intended will show the unsuitableness of such a place for learning farming. The sole object of an experimental farm is to become acquainted with the best properties of plants and animals by *experiment*, and to ascertain whether or not these objects are worthy to be introduced into the ordinary system of farming pursued in the country in which the experimental farm is situated. New plants and new modes of cultivation should be tried on the experimental farm, for if the ordinary plants be adopted, it is no experimental farm at all.

In school-farms, if the work be entrusted to the pupils, there can be no *model* exhibited to the surrounding district, and how on earth can the manager of such an establishment be expected to show a profit? But when a farm is expected to be a *model-farm*, an *experimental* farm, and a *school-farm*, all in one, to look for a profit from it is nothing less than childish.

I still adhere to my opinion, so often expressed in this Journal, that the only way for a young man to learn farming is to pass two or more years in the house of a first class farmer, where he will have the opportunity of seeing superior cultivation, a well managed herd of cattle, and a good flock of sheep. If such a farm is difficult to find in every neighbourhood—for capital is scarce in this part of the world, and without capital the thing is impossible—I see no objection to the government affording some moderate assistance to selected parties in each county of the province, provided always that, even then, the owner of the model-farm be not expected to show a profit from his books until the expiration of at least three years from the commencement of his undertaking.

—Buttermilk for Pigs.—The profit of raising pigs on a dairy farm has never been questioned, and yet there are many persons who underrate the value of buttermilk as a food for pigs and hogs. Buttermilk contains about 10 per cent of dry matter, and is composed of 3 per cent. of albuminoids (caseine), 5·4 of carbo-hydrates (milk sugar), 1 of fat —nutritive ratio, 1·26. The proportion of muscle-forming matter is greater than in whole milk, and this deficiency of oil renders buttermilk slightly constipating. To feed it in the most skilful manner would require that a somewhat laxative food, such as flaxseed, be added to it. Three quarters of a pound of boiled flaxseed to the 100 lbs. of buttermilk will supply oil in the same proportion as it exists in the natural milk, and will greatly improve its feeding value, making it very nearly as nutritious as new milk. If flaxseed is not to be conveniently had, the old-style linseed-oil meal may be substituted, using 1 lb. of meal to the 100 lbs. of butter-milk. The object is to prevent constipation. In a general way, it may be said that 100 lbs. of butter-milk have as much nutritive value as 20 lbs. of corn, and is better adapted for young pigs.—*National Live Stock Journal.*

In the above paragraph it may be well to notice that flaxseed contains about 37 % of oil and old-process linseed-cake only 12 %. Therefore, if the latter be used, the quantity per 100 lbs. of milk should be about 2¼ lbs. Again, boiled flaxseed, if uncrushed, will pass through the animal almost entirely undigested. My plan would be to mix pease and linseed, ground together, at the rate of 4 bushels of pease to one bushel of linseed, and suit the proportion given according to the age and constitution of the pig. A variety of food is always beneficial to every description of stock. And we must not trust *too* much to the theory of the matter. What says Dr. Voelcker, the chemist to the Royal Agricultural Society of England? "It is not a chemical analysis alone that can determine the exact value of any food. To decide on analysis alone would be an error. The complicated structure of plants and of their seeds open up subjects of which we know not much", Report to the chemical committee of the R. A. S E., January, 1886.—And the longer I live the more reason do I

see to distrust the positive assertions of those who found their system of cattle-feeding on the tables compiled by mere theorists. Four years ago, every pseudo-scientist who meddled with agriculture was crying up the superiority of the new-process linseed-cake over the old kind—oil was of little use in fattening animals, they said!—Now, a healthier state of things prevails, and cake, both linseed- and cotton-cake, is worth much or little in proportion to the amount of oil it contains; at least so says the market.

Hoed crops.—A short letter on this subject will be found on page of this number of the Journal. From a previous communication, I was half afraid that "Quebec" was opposed to the extension of the system in this province, either because he did not see his way clear to the obtaining of good workmen or workwomen, or because he did not sufficiently appreciate the value of roots as food for stock. In a late issue of the English Agricultural Gazette, Sir John Lawes has these irrefutable observations. "Summer-fallows or root-crops are the only mode of keeping land fairly clean, and to grow grain upon foul land is simply a waste of time and money." So we may as well make up our minds that until we can bring ourselves to employ one or other of these plans, we shall not see our farms as productive as they ought to be.

"Why is it that the average yield of wheat on the long-used soil of the United Kingdom last year amounted to 31 bushels an acre; while the average yield on the comparatively new soil of this country was only 10½ bushels? If prices, as seems likely, are to be lower here in future, won't it be necessary to force the soil to yield larger crops, or to abandon wheat-raising altogether, as a source of loss instead of profit?" This question was asked, editorially, in a late number of the Rural New Yorker. I made an observation to the same effect in a late number of this Journal; and, in reply, my excellent friend, Dr. Hoskins, was pleased to devote a column and a half of the Vermont Guardian to an exposition of the superior wisdom and economy of the American farmer who, by producing 10½ bushels of wheat per acre, grew wealthy, whereas his English brother found no profit from his trebly superior harvest. I fancy that the American farmer, in reckoning up his gains at the end of the year, imagines that, as the farm is his own, he pays no rent; but rent is rent, whether it is viewed as the interest of the cost of the land or otherwise. A farm which is worth, as many farms in the State of New-York are worth, say, twenty thousand dollars, is, in reality, rented at twelve hundred dollars a year,—money being worth, I presume, at least six per cent, to say nothing of the interest, at a much higher rate, on the capital invested in stock and implements.

Milk which will not make butter.—Every autumn, I hear complaints from farmers, that they have great difficulty in churning. This year, the trouble seems to have been greater than usual, for I have met with several letters, both in American and English papers, on the subject. Professor Sheldon, in a long communication to the Rural New Yorker, attributes the difficulty to the long period which has elapsed in most cases since the calving of the cows; and this, in some cases, may be the cause; but, how comes it then that I have frequently had to deal with the milk of a cow that has calved eighteen months, and yet have had no difficulty? Of the cause that milk treated in the usual fashion will not make butter I know nothing—I don't believe anybody does—but I do know that a cure exists and I place it at the service of my readers.

In November last, a gentleman of Sorel, told me that he was in trouble about his cow. "She gives plenty of milk," said he, "and the cream is rich and abundant, but we can't get any butter from it, none at all: we have tried for *two months*, and not one bit will come, never mind how long we churn" I went and looked at the cow; a good half-bred shorthorn; looked like a milker, dairy clean, and churn all right. Food? two bundles of timothy a day. Here is the fault, thought I, and recommended the deduction of one-third of the hay and the substitution of four pounds of a mixture of peas, oats, and linseed. As soon as the cow became accustomed to the change of food, all difficulty vanished, and the proprietor told me that subsequently they made butter twice a week without any unusual trouble.

The next week I happened to be passing the house of M. Séraphin Guévremont, an improving young farmer, whose name has been mentioned with praise more than once in this periodical, when Madame, his wife accosted me, requesting me to walk into the yard and look at her cows, "for," said she, "we have been trying to make butter from their milk for the last nine weeks, and we can't get any!" Well, this was a stunner, for I knew very well that nothing could be better than the food these good people gave their cows—three in number—swedes, potatoes, hay, and *goudrole*—sometimes called *gabourage*—that is, a mixture of pease and oats, and in no stinted quantity either. Madame, too, I knew to be a capital dairy-woman. Altogether, I was what is vulgarly called "floored"! However, I determined to try our old-fashioned plan of arranging the milk as practised in the West of England. Placing a pan of milk, after standing 24 hours, in a vessel of *cold* water on the stove, I allowed it to heat up gradually to 175° F. I then placed the pan of milk in the dairy to cool, and after skimming off the cream, and beating it for a few minutes in a bowl, the butter formed in grains, was washed in that state with three waters, made up with two wooden *spatulæ*, and was pronounced by the most prejudiced old woman I ever saw to be the best butter she ever tasted! The butter took eight minutes to "come," six minutes longer than usual, but the fact is that I was in a hurry, and did not allow the cream time to warm up to about 60° F. the proper temperature for this mode of working.

I am inclined to think that, though some of our farmers' wives may fancy that this system is a little *fidgetty*, it will be tried in many places next autumn when the difficulty of common churning is first felt. I know that in the parish of Saint-Justin it will be practised by several people, and if I did no other good by my visit to that place my time was not spent in vain.

OUR ENGRAVINGS.

Elevator Ditching machine.—This engraving was crowded out last month, so I can only repeat what I said about it then, viz., that a gentleman, who has seen it in operation, tells me that its work is very good.

Two-row potato-planter.—The most notable exhibit at Islington was the famous potato planter of Messrs. Murray & Co., Banff, N. B., the most successful in prize trials and practice of any yet brought out. It is made to plant one, two, or three rows at once, from one to three sizes of drills, and also with mould-boards to open the land and cover at the same operation. We give an illustration of the double form of it for two drills, from which it will be seen that the principle is a chain passing over wheels similar to the style of a threshing machine elevator or chain-pump, with little buckets or scoops attached at intervals. As these pass up through a hopper filled with the cut "sets," one is lifted by each, carried up and dropped down in the drill, and this with unerring regularity and accuracy. For those farmers who plant a

large breadth of potatoes, and where labour is scarce, the machine is simply invaluable.

Ladybird—Guernsey cow.—First prize milking competition over all the Jersey and Guernsey classes, at London Dairy show, 1885.

Rayon D'Or.—This famous stallion is now serving mares at Erie, Pa. Dark-red chestnut in colour, foaled in 1876, by Flageolet out of Araucaria; bred by Count Lagrange at the Dangu Stud, France. As Flageolet combines the blood of Touchstone, Bay Middleton, and Venison, and as Araucaria is out of that grand mare Pocahontas, the price paid for Rayon D'Or—$30,000—does not seem extravagant.

Last month's engravings of Hampshire Down rams and ewes were the most genuine portraits conceivable. The photographs, which I am having carefully framed and glazed for my private delectation, have *not* been touched up by an artist, as is usually the case with this style of work—to deceive people.—Won't some one go and see Mr. Wood's flock and report upon it? Look, please, at the neck of the ram, "The Baro.." and think of that amiable joint we never see in this country, a boiled neck of mutton with its caper-sauce! As a rule, our sheep, apparently, have no necks, except the scrag-end. And what a saddle of mutton—too good to want any sauce—might be cut out of that long, level back! *My* butcher, after about two years' teaching, has almost learned how to cut a saddle of mutton, only he *will* leave the three first bones of the neck on each side. A saddle is two loins; neither more nor less, and should be begun from each side of the tail which should *not* be split. If the legs are nicely rounded out, both legs and saddle will be perfect—the Scotch "gigot," which is always cut here, and which comes of course from the French, is a compound of leg and loin; difficult to cook equally, impossible to carve elegantly, and should be banished from all "good men's feasts;" Shakespeare—Hem!

Guernsey cow.—The portrait of the Guernsey cow given at page 72 of this number of the Journal has every appearance of genuineness. Last week I saw La Major, the Revd. M. Gérin's celebrated prize-winner; a pure country-bred cow, and the very image of this Guernsey, Ladybird, who this last winter beat all the Jerseys and Guernseys in the milking competition at the Islington Dairy-show. Again, on my showing, experimentally, the engraving to a neighbour of mine, who possesses a cow remarkable for its milking qualities—16 imperial quarts a day—the good woman exclaimed, with a shout of delight: Mais, Monsieur, c'est le portrait de ma vache! Which, barring that her cow's horns are not neat, it might really be supposed to be! In fact, the resemblance of both cows to the portrait is such as cannot fail to strike any observer. My neighbour's cow is to visit Rufus, a pure Guernsey bull, once my property, next week, and, if the alliance prove fruitful, and Juno Lucina be propitious as to the sex of the offspring, I shall have to persuade the present owner to transfer the cow and calf to me, at never mind what price.

The Sorel cow beats La Major as to her teats, which are of very superior form, neither too large nor too small, but I suspect La Major's bag is the larger of the two. The points of the Sorel cow are downright dark yellow, the inside of the ear perfectly deep-orange.

Close by, there wons a darkish red cow; not a Canadian I should suppose, but some queer offshoot of a wandering Devon bull, out of I-don't-know-what-sort-of-a-cow. She is remarkably neat about the head and horns; very fairly shaped as a milch-cow; would take on fat readily, I think, when dry; and, on our Sorel pasture, which, as my readers know by this time, is poverty itself, gives fifty pounds of milk of *good* quality a day; equal, anyhow, to fourteen pounds of butter a week. The owners of the two Sorel cows won't look at $50.00 a piece for them, I am sorry to say—quite right too. In May, I intend to make a tour of the parishes in the county of Maskinongé, and combine a search for extra cows with trout fishing. I wish I could take photographic portraits; I would soon have a portfolio full of cows.

And about these, so called, Canadian cows. How are we to distinguish them? I know a shorthorn pretty well, but I don't think I could tell the difference between a pure-bred Shorthorn and one of seven-eighths blood. Is the colour any guide? I should fancy not. La Major looks to me like a diminutive Welsh cow: just the same sort of black colour, and the same horns. Now the Sorel cow is striped-bronze, (1) with hardly a speck of white; the same horns, only, unfortunately, one is broken, which rather spoils the look of the head; and, yet, if La Major is a pure Canadian, I, judging from her build and general stamp, should say that the Sorel cow is a pure Canadian too.

Again, as we shall have an abundance of Jersey and Guernsey bull-calves this spring, why not begin the contemplated improvement of our herds by using these cousin-germains of our cows for that purpose. It will take an indefinite number of years to improve the Canadian race by the process of *selection;* why not start at once on our road by the process of *crossing?* It would be all in the family, that is certain, and the more rapid way by far. For myself, as my readers know, I prefer a Guernsey bull for the purpose, and for this reason: while the Jerseys have always been bred for butter, the, in my opinion, wiser Guernsey farmers have kept in their eye butter and beef. One thing is certain: the Guernseys have never been bred for colour! A black tongue or a white switch would be of no importance in the island shows.

Major Paul, of Sainte-Anne de Sorel, tells me that the agricultural club of that place has a reserve fund of $240.00, of which sum the members intend to spend $60.00 in the purchase of a banner for the Saint-Jean-Baptiste fête. Well and good; but if they would spend $25 in the purchase of a Guernsey bull-calf, and $25.00 in the purchase of a Hampshire-Down ram-lamb, I should be all the more delighted Except here and there an Ayrshire cross from one of M. Mandeville's bulls, a more pitiable lot of stock is rarely seen than the stock round Sorel. The cows give hardly any milk, the sheep are neglected, and the pigs—barring some Berkshires of Capt. Nelson—the pigs are—well, I don't care to eat them.

Unit formula for manures.—According to the English market, the following are the prices *per unit* for artificial manures..... ton = 2,240 lbs.

Ammonia.....	9s. =	$2.16
Soluble phosphate	2s. 6d =	.60
Potash	2s. =	.48

Now calculating at these rates per unit on our ton of 2,000 lbs., I find that we are paying more than double the price here for the same article. I append the selling price of four different mixtures of artificial manures now on the market in the Dominion, adding, by way of contrast, the cost price of the same at the present time in London, England.

GUARANTEED ANALYSES.

Ammonia.....3 to 3½ per cent.	$17.30 price in Eng.	
Soluble phosphate...19 to 21 " "	*35.00* " *here.*	
Potash .....2 to 2½ " "	17.70 balance.	

(1) The *brindle*, it may be, of "Pat. O'Flanagnan's" Kerry, or of the Breton stock A. R. J. F.

Ammonia..... .....2 to 2½ per cent.	$15.00 price in Eng.	
Soluble phosphate...20 to 22 " "	32.00 " here.	
Potash .....1 to 1½ " "	17.00 balance.	

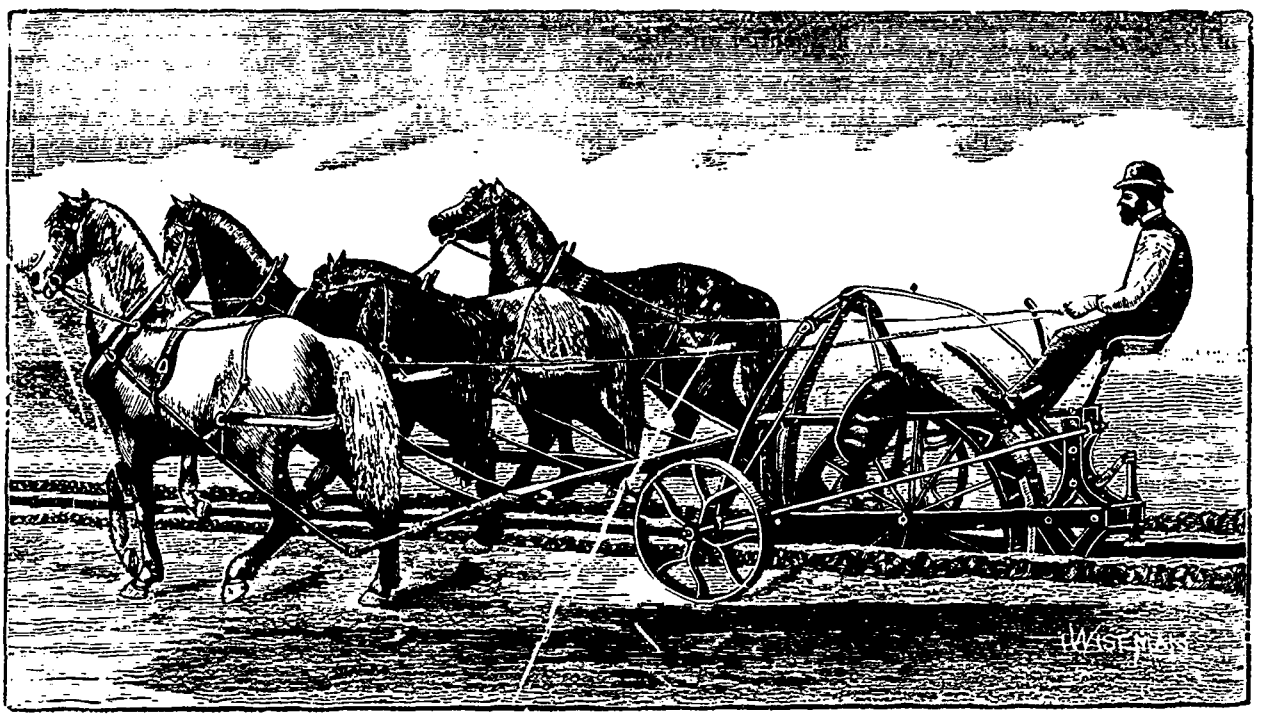
Ammonia ....4 to 4½ per cent.	$19.20 price in Eng.	
Soluble phosphate..16 to 18 " "	40.00 " here.	
Potash . .....7 to 8 " "	20.80 balance.	

PLAIN SUPERPHOSPHATE.

Soluble phosphate...24 to 26 per cent	$10.70 price in Eng.	
	26.00 " here.	
	15.30 balance.	

Pacey's rye-grass.	8 lbs.....	$ .80
Timothy,	6 lbs.....	.18
Orchard grass,	7 lbs.....	1.50
Meadow fescue,	3 lbs.....	1.05
Red-clover,	3 lbs.....	.45
White-clover,	1½	.45
Alsike clover,	1½	.30
	30	4.73

On very light soils, in poor condition, there would be no use in sowing the Orchard grass. In such a case I should replace it with 5 lbs. of rye-grass. Mr. Ewing has some doubts about rye-grass standing our winters, but it bears an immense deal of cold in the North of Scotland, and in the province of Ontario Mr. Brown recommends it, so I should not be afraid of sowing it. There is no *cow-grass—trifolium pratense perenne*—to be had in Montreal. I am sorry for it, as it is a most valuable constituent of permanent pasture.(1)



THE ELEVATOR DITCHING MACHINE.

As long as our manufacturers of artificial manures persist in charging such prices, so long must they expect their sales to be restricted. I see Dr. Hoskins did me the honour to transfer a paragraph on this subject, p. 34 of the March number of the Journal, to the columns of the Vermont Watchman; and in his remarks thereon, he showed plainly that he and I are of the same mind. (1)

Grass seeds —For grass intended to lie out four or five years, I, after a good deal of consideration, am inclined to recommend the following sorts and quantities. Mr. Ewing writes me word that he has Pacey's perennial rye-grass for seed at ten cents a bushel. I have a sample under examination, the result of which I will communicate to my readers as soon as it is complete. (80 °/₀ grew.)

(1) The extra profit in the above cases varies from 102 °/₀ to 143 °/₀. A. R. J. F.

The grasses in the above list are quite enough for an *acre* of land; for the arpent about one-sixth may be deducted. A pasture of this kind can be fed down as often as may be desired without injury to the plants. I should rejoice greatly could I succeed in giving the death-blow to the ordinary meadow composed of timothy and red-clover.

In sowing grass-seeds, I prefer sowing the mixed grass-seeds by themselves, and then the mixed clovers, unless a trustworthy seed-barrow and a good seedsman can be employed. If you mix both classes of seeds together, proceed as follows:

Lay the rye-grass seed &c., on the floor of the barn in a flat-topped heap and pour the clover-seeds over it, turning the mass over and over with shovels until the seeds appear thoroughly mixed. Although the clover-seeds are very much

(1) I have just had a letter from Mr. Ewing, in which he says "as I have received an offer of rye-grass seed from Megantic, I think that shows it is hardy enough." A. R. J. F.

heavier than the rye-grass, they do not fall through it to the bottom of the heap, on account of their smallness, which enables them to lie between the two valves of the *palœ*, or chaff, of the rye-grass seed.

Steamed food for Cattle.—Mr. Crozier, one of the best known American *agronomes*, writes to the Country Gentleman as follows :

I beg to say that I have not steamed any food for cattle for the past three years. My experience in steaming is that it produced more milk—in fact it strained the cows too much, and the calves when dropped were not so strong as they are on the feeding now given. I know that we get more butter than I did when steaming. Last season, from January 1882, to January 1883, I sold 9,100 lbs. of butter from 32 cows, and would have done better but for the very dry summer we had here. During the season of 1881, I made 9,540 lbs. of butter from about the same number of cows. Were I selling or making milk for the market, I certainly would steam all the food for the cows, as it increases the milk record, I think, from 15 % to 20 %. It is to get the most butter with the least expense that I now feed cows.

The Scotch are supposed to understand the economy of cattle-feeding as well as most people. Hear what they say :

" To me," observes Mr. Howden, Lawhead, East Lothian, " it has been most decidedly shown that preparing food by steaming is anything but profitable."

Mr. Boswell, Kingcausie, Kincardineshire, comes to the same conclusion as to the unprofitableness of feeding cattle on cooked food : " It is not worth the trouble and expense of preparation to feed cattle on boiled or steamed food; as, although there is a saving in food, it is counterbalanced by the cost of fuel and labour, and could only be gone into profitably where food is very high in price and labour and fuel very low;" the very reverse of what obtains here, where labour is high and food low.

Mr. Walker, Ferrygate, East Lothian, went largely into the question—see his experiments in the tenth volume of the Highland and Agricultural Society's prize essays—the conclusion he comes to is : " We have no hesitation in saying that in every respect, the advantage is in feeding with raw food." Mr. Walker also mentions that he put two steers to grass on the 20th May, one of which had been fed on raw food and the other on cooked food. In their external condition, no one could have said how they have been fed. The steer on raw food gained condition until the 20th July, up to which time the one on steamed food had lost 42 pounds live-weight. However, we can't generalise from one instance.

Lectures.—Cicero somewhere says, that the power of the orator lies in the ears of his audience; or words to that effect. I have had the pleasure lately of lecturing on agriculture to two audiences composed entirely of French-Canadian farmers, and anything more delightful than the fixed attention with which my addresses were listened to I never experienced. At Sainte-Ursule there were about 250 persons present, and at Saint-Justin about 160. Many of the questions asked after the lectures were finished, showed plainly that want of power to weigh an argument is not among the mental defects of the farmers of the North bank of the Saint-Lawrence. I am told that there are one hundred of these clubs—*cercles agricoles*—in the French country! There is not one, as far as I know, among the Eastern Township people! The Agricultural societies are not at all the same thing: at their rare meetings there are none of those discussions which so usefully rub mind against mind, to the dispersion of prejudice and the combination of experience.

I must be allowed to take this opportunity of thanking Messieurs les Curés of the two parishes for their extreme care for my comforts. Had I been a most intimate friend, those two gentlemen could not have taken more pains to make me feel myself at home.

At Saint-Justin, M. Gérin, the curé, propounded rather a startling question : Why is it that the average yield of wheat last year was, in England, 32 bushels to the acre, and in the Province of Quebec 8½ bushels? The query seemed to have rather a stunning effect, and, evidently, set the farmers a-thinking! An answer might be given without much trouble, but it would be rather a long one. One thing is certain : no country where all the wheat is spring-sown can compete with another where it is all fall-sown. Again : a country where no root-crops are grown and where no fallows are made, cannot compete with a country where one or the other of these methods of cleaning the land is universally practised. Lastly : the rotation of crops is a thing apparently never thought of here, and that alone would go a long way to account for the almost incredibly small yield of wheat in this province.

I saw enormous heaps of straw lying about in the fields, where it had been, clearly, ever since it was threshed. The calves, tied by the neck I regret to say, were lying on the bare boards! All the liquid manure lost! And in-calf cows with nothing but straw to eat; how on earth can the coming calf be anything but an abortion?

La Major's two *in futuro* calves are sold in advance for $30 and $50 respectively! M. Gérin has two of her productions, a yearling and a two-years old—very promising both—heifers, fortunately. The name of this celebrated cow puzzled me a good deal until I found out that her former owner's family designation was " Major!" M. Gérin only gave $20.00 for her, and a cheap purchase she was, as she has already won $200 dollars in prizes, besides giving an inordinate supply of milk, cream and butter for the supply of the *presbytère*. M. Major could have had but little idea of what a cow ought to be when he sold La Major for such a price : she shows her point so plainly that a child of twelve years old could have told her value.

Sheep losing their wool.—If sheep are kept too closely confined in winter their wool frequently peels off. I saw a case of this last month, and a sad sight it was. A good roomy shed is, as I have often said in this periodical, all that sheep require. Cold does not hurt sheep, but sleeping in wet wool does.

The weather.—Crows made their appearance about the 15th of March. To-day, March 31st, it is raining merrily, and this undrained town of Sorel presents a succession of ponds in the streets which keep the female population at home. Never mind! Everything promises an early spring, and an early seed time here means a good harvest; so who cares for a few puddles? (1)

Arthur R. Jenner Fust

The Dairymen's Association of the Province of Quebec.

Resolution adopted at the meeting of the executive commitee, Montreal, February 9th, 1886.

M. J. de L. Taché, secretary of the Dairymen's association, sends us the following :

In compliance with the decision arrived at by the society, at its meeting of the 13th of January last, to send dairy-products of this province to the Colonial Exhibition to be held this year in London, the executive committee of this society recommends :

(1) There is every prospect of seed-time beginning on the 23rd of April. (I sowed wheat, pease, and potatoes 22nd.) A. R. J. F.

That this society send to London, next season, and during the continuance of the exhibition, fresh specimens of the butter and cheese of this province, at least every fortnight, in order that samples of our dairy products in good condition may be always on exhibition. That each member of the society be invited to send regularly, and at certain periods which shall be fixed from time to time for each exhibitor, samples from which the articles to be exhibited shall be selected in such a manner as to allow all, as much as possible, to take part in the exhibition;

That in order to ensure a proper choice of the articles to be exhibited, a regular inspection of the samples thus sent shall be established at Montreal;

That all the products decided by the said inspection to be of good quality be purchased by the society at the highest market price, whether they be sent to London or not;

That the products bought or exhibited be sold to the profit or loss of the society.

That the articles be exhibited under the control of the society, but in the name of the makers or exhibitors who shall have sent them;

That unless circumstances intervene, the consideration of which shall be left to the special exhibition committee, the number of boxes of cheese to be sent at each despatch shall be from 12 to 24; and the number of packages of butter shall be also from 12 to 24, to be divided between the two qualities, creamery and dairy-butter. All latitude to be allowed to the same committee as to the regulations affecting the special products offered for exhibition;

That articles for exhibition be sent on board steam-boats, and exhibited in London in refrigerators;

That the special committee shall regulate the conditions of manufacture and the method of packing to be observed by the exhibitors;

That, considering the necessity of 1. establishing a regular inspection at Montreal, and of having in that city an agent to receive and forward goods, 2. having a special establishment for the carriage of articles sent and for their exhibition in London; 3. having a commercial representative in London to provide for the regular sales of the exhibits; 4. securing an advance of about one thousand ($1,000) dollars for the purchase of the accepted articles—the association, through its secretary, should apply to the governments at Ottawa and Quebec for the means requisite to fulfil all the above conditions;

That all factories enrolled for exhibition shall be visited by the inspectors of the association from the opening of the season.

In addition, the executive committee would advise:

That the association, in accordance with the resolution adopted at the last session of the Council of Agriculture on the 3rd February last, accept the charge of making and preparing the Herd-book of Canadian cattle, and a Livre d'or agreeing with the aforesaid Herd-book (1)

Competition of Farms; County of Portneuf.

(Continued from March.)

In former articles, we gave the reasons which guided us in the distribution of the first three prizes in the competition of the best cultivated farms in the county of Portneuf. We now come to the fourth and fifth prizes, which we condensed into one, and divided that one between MM. Louis Jobin, of Saint-Augustin, and Ulric Paquin, of Deschambault. Before comparing the cultivation of these two gentlemen, let us point out the distinctive points of each.

M. Jobin is the proprietor of a farm measuring 3 arpents by 30; he has besides two other pieces of land, the one 2½ arpents by 6, and the other 3 arpents by 6. The latter piece is about 600 yards from his house. Altogether 123 arpents—104 acres. On a part of the farm, M. Jobin pursues the following rotation: 1st year, hoed crops; 2nd, grain sown down with grass-seeds; 3rd, 4th, 5th hay; 6th and 7th, pasture; 8th, oats. (1)

What remains of the 90 arpents is divided into six fields of about 8 arpents each, on which M. Jobin has begun a rotation of six years: dunged oats with grass-seeds; four years hay; one year in pasture. Another piece is sown with grain and grass-seeds once in five years, and the grass remains, for mowing or grazing, four years. This rotation is certainly better than the system generally pursued in the province of sowing successive crops of grain. But as M. Jobin is a man of progressive views, he will pardon us if we say that there are two defects in this rotation: The first is common to all the competitors: there is no cleansing member of the course. The second, and the defect is general throughout the province, that the system does not admit of the manuring of the entire farm in a regular succession. It is this, together with the waste of dung, that diminishes the yield of our land by much more than one-half. As we shall see, M. Jobin preserves his dung carefully; we proceed to show how he may correct the two faults we have pointed out.

We advise him to sow grain two years in succession. But, immediately after the first crop is harvested, let him pass the cultivator (grubber) both ways across the piece in question—along and across the ridges—choosing for the operation a dry time. The land should be then laid up for the winter with a good deep furrow, and plenty of water-furrows should be made. If this ploughing is given across the ridges, and the open furrows cleaned out with the plough, along the old ridges as well as across them, (2) the land would be better drained and would moulder down more under the influence of the frost. The following spring, again choosing a dry time, the cultivator should be used until all the weeds are destroyed, and the land thoroughly pulverised. As soon as this is accomplished, sow buckwheat, on the furrow, and cover it in with the cultivator rather than with the harrow; particularly if the weather threatens to be dry. As soon as the buckwheat is in, sow a mixture of several kinds of grass-seeds, so as to establish meadows and pasture that will last twelve or fifteen years at least. The manure may be given as a top-dressing, though it would be better to spread it and plough it in *at once*, so as to prevent its drying. We feel sure that this system would greatly increase the yield, by the manuring, the pulverisation, and the cleaning of the land, without materially augmenting the labour of the year. To carry it out over the whole farm, it would suffice to keep the meadows and pastures down for a longer period, and not to break them up unless there were means of manuring them the following year.

In these newly laid down meadows, sown late, care must be taken not to pasture animals the first autumn. It would injure them immensely. I reckon too that the manuring would tend greatly to assure the taking of the grass-seeds.

The buildings of M Jobin are very elaborate; far too costly for the general run of farmers to imitate. They are 130 feet x 36; built on a stone foundation, four feet high all round the barn, and eight feet high under the stable, where it

(1) It seems that the "livre d'or" means a list of the winning cows. The "livre d'or" kept at Venice was a register of the noble families of that city. A. R. J. F.

(1) Precisely the rotation I recommend for the province in general. A. R. J. F.

(2) I am not sure that I understand this passage; Trans.

serves for a manure-pit. The bottom of the pit being wet, the flooring is of tongue-and-groove boards. We were rather in doubt, on seeing this expensive building, if we ought not to take off points on account of its extravagant cost. The question deserves consideration in future competitions.

A few drains have been laid; failures, we regret to say. So much time lost, and so much discouragement incurred. Nevertheless, good drainage would double the yield of these farms, for the land is cold.

The chief distinction of this property is the care which is taken of the manure. The hogs are allowed access to the dung-pit, so nothing is lost. Still, we fancy the same result may be arrived at without so great an outlay as M. Jobin's. We intend shortly to prove this statement of ours in a series of articles, with illustrations, the fruit of thirty years study of the best systems of Europe and America. In spite of the excessive expenditure in this construction, M. Jobin does not the less deserve credit for his work, for he has done his best after having visited and studied buildings which have since served as a model at one of our agricultural schools.

Clearance of stones has been expensive work on these farms. M. Jobin's implements are good, *but he has no grubber!* We were glad to see the five-inch tires on the dung-carts and hay-carts. They don't cut up the meadows, &c., like the narrow wheels.

M. Ulric Paquin, Deschambault, has a farm of 75 arpents, = 64 acres, 10 arpents of which cannot be cultivated, party on account of the floods, and partly on account of the numerous *coulées*.

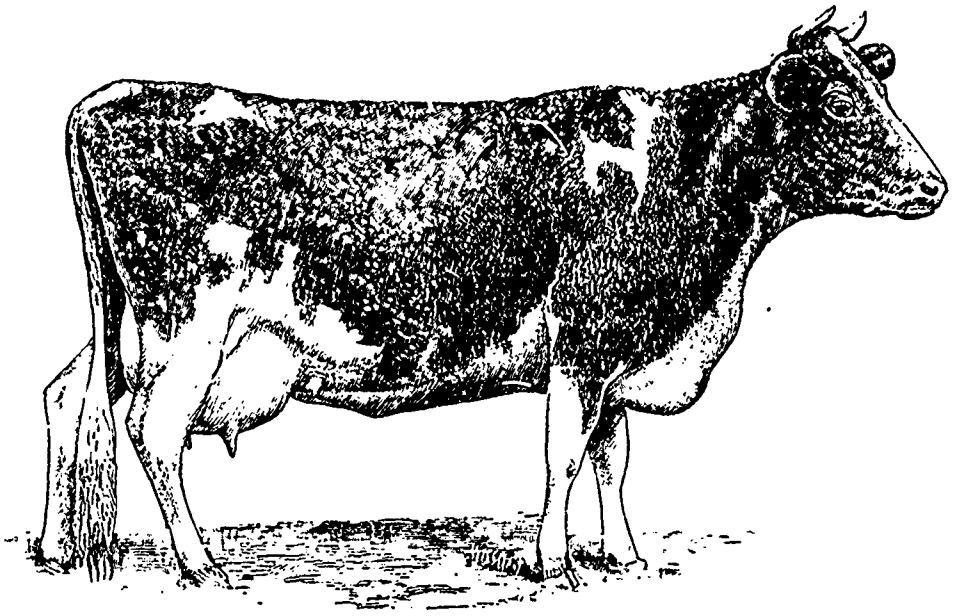
Some of the fields situated in the bottom are alluvial soil and naturally very rich, although they have been scourged almost to death by successive grain-crops before they came into M. Paquin's hands. Other high-lying spots require manure, rest and labour to make them worth any thing. We think that carting, say, 60 loads an arpent of the alluvial soil from the low-lands on to these heights would be productive of much benefit. The soil might be thrown up in heaps at any idle time in summer, and carted out during the early frosts; on the first snow, even, unless the rise of the river would be a hinderance.

About $\frac{2}{3}$ of the farm is in grass. The annexed table shows that the crops are good, except the oats on the upland.

HARVEST OF 1884.

		Seed.	Crop.
Meadows	28 arpents	...	3500 bdles.
Pastures	28 "	25 head of cattle.	
Oats	10 "	20 bushels	200 bushels.
Wheat	$2\frac{1}{4}$ "	3 "	60 "
Buckwheat	2 "	2 "	100 "
Potatoes	2 "	35 "	350 "
Turnips	$\frac{3}{4}$ "	... "	200 "
Barley	2 "	3 "	50 "
In all			410 bushels of grain. (1)

Eight cows gave during the year 800 lbs of butter, to say nothing of supplying the house abundantly with milk and cream. Clover and maize cut green during the dry season would greatly increase the yield of butter.



LADYBIRD II., 723 F.S, R.G.A.S.

A great stoning work has been done. Weeds are hand-picked out of the growing grain. The vegetables are well cultivated, but the turnips are left too much in the ground—turnips should grow *out* of the ground—in singling them don't be-afraid of drawing the earth away from them. To this end, the young plants, after being hoed, would lie at length on the ground; in 24 hours they will be bolt upright again and will grow with renewed vigour. This simple detail will materially increase the crop. (2)

We judged the ploughings and harrowings on this farm to have been badly done during the last few years. The perfect

(1) The quantity of seed-grain is much too small. If M. Paquin would sow 3 bushels of oats, 2½ bushels of wheat, and 2½ of barley to the arpent, his crops would be better and *would ripen earlier*. If *two-rowed* barley is sown, one peck more must be allowed. A. R. J F.

(2) I presume M. Barnard is speaking of swede-turnips. I do not like leaving white-turnips too bare of earth, for it is not desirable to grow them too large, if over 15 or 16 inches in girth, they are invariably spongy, and acrid in taste, however fine they may look.
A. R. J. F.

pulverisation of the soil largely increases the crops, and is one of the necessary parts of the preparation for meadows. A good heavy roller passed over the grass-land in spring would be a great benefit when the frost has raised the soil.

M. Paquin has drained his garden with wooden pipes: they act perfectly. We observed a patch of Orchard-grass four feet high, which promised a yield of 400 bdles of hay per arpent. A most useful grass this; very early and makes famous pastures. Excellent as hay, but it must be cut *very green*. The seed—14 lbs per bushel—sells for $3.00. M. Paquin had better extend the cultivation of this grass, especially in his pastures.

Sixth prize.—M. Athanase Dufresne, Deschambault.

The two farms of M. Dufresne contain 180 arpents = 150 acres; of which 110 arpents = 93 acres, are in cultivation, the rest in bush and bog. As M Dufresne can get lime very cheaply, we recommend him to make composts in his "savane" of earth and lime mixed at the rate of a quarter of a bushel of quick-lime to a tumbrel of earth The heaps should be placed in a spot near a ditch that there may be no danger of their being damaged by water. These composts spread on the pastures, or on land in preparation for potatoes, at the rate of 50 loads an arpent would be of great benefit for seven or eight years at least.

—(*From the French.*) ED. A. BARNARD.

NIGHT AND DAY.—A monthly record of Practical Philanthropy Edited by Dr Barnardo: March, 1886.—J F. Shaw & Co., 48 Paternoster Row, London, E. C.

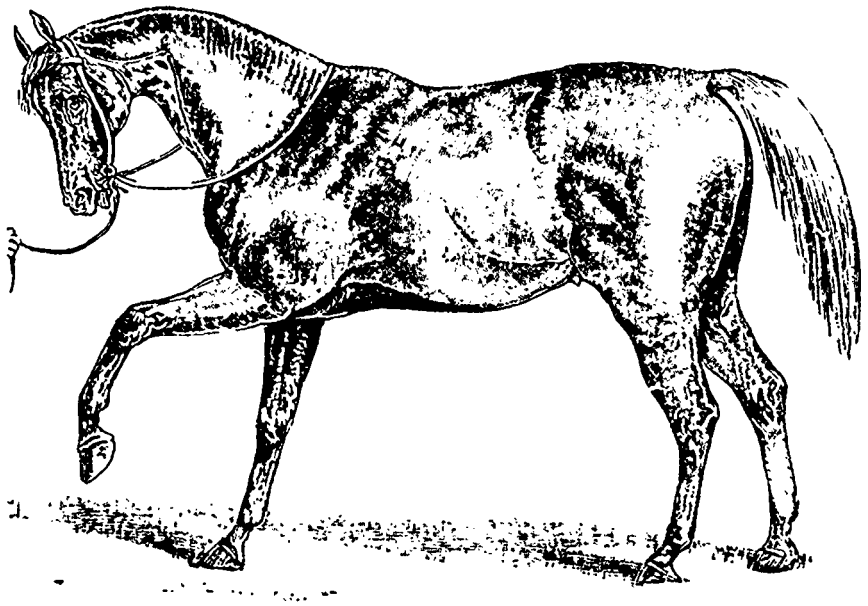
The above publication has been forwarded to me for notice. Any one who knows the slums of London as well as the writer of these lines, who has seen the terrible faces of the street Arabs of both sexes as they prowl about the confines of the wealthier districts of that great city on the watch for booty, must welcome the work of any one, be he Christian or Jew, Turk or Infidel, who will boldly thrust himself into the dens of these worse than wild beasts, and strive boldly with the fiend for the salvation of his wretched slaves, if haply he may save some. There is no room for exaggeration in this matter. The work done, and being done, by such men as Denison, Barnardo, Müller, and other devoted servants of our common humanity, is beyond all praise, as it is above all reward.

A. R. J. F.

Mr D. A. Jones' methods of Swarming, Extracting, Fall-Feeding.

TO THE EDITOR OF THE "JOURNAL OF AGRICULTURE."

Dear Sir,—Mr. Jones practises both natural and artificial increase—by the former, I mean allowing the bees to swarm naturally, and by the latter, using what is called the *nucleus* system. In Beeton the usual time for swarming, is between the 22nd June and the 1st July,—it depends a great deal upon the kind of season, and the way the bees have been treated during the spring. Swarming, of course means, that all the old bees leave the hive with the queen because the place has become overcrowded, and they know that they can work better in new



RAYON D'OR.

quarters. But when a swarm thus leaves a hive, it of course provides for those bees which remain by building from ten to forty queen cells, each of which, if properly managed, will hatch out a queen.

Thus, swarming is of use in two ways to the bee-keeper, it increases his stock, and supplies him with queens.

The *nucleus* system consists in taking one comb containing brood and bees from a strong hive which is about to swarm, and placing it between two empty combs, in a new hive—this latter is the nucleus or beginning of a colony. Before it is complete, however, two or three frames full of bees are shaken off, in front of the nucleus, and allowed to run in—this latter contingent is merely to add to its strength.

These nuclei are of course strengthened by degrees, and in five or six weeks are in good working order.

I am not going to discuss the question of natural versus artificial increase, or in other words swarming versus the nucleus system, as the arguments *pro* and *con* are infinite in number, and to do it justice would mean an article large enough to fill up one number of the *Journal*.

As it has been proved by apiarians that queens raised under the swarming impulse are better than those raised artificially, (which latter process consists in simply taking a queen out of a hive and forcing the bees to raise for one themselves), Mr. Jones has to allow a certain number to swarm naturally, while the rest are kept down by forming nuclei of their surplus combs, as before described.

The first indications of swarming are of course the building of queen-cells—these cells are capped eight days after they are built and in eight more days the queens hatch out, i. e., on the sixteenth day of their lives.

About the seventh day after these cells are capped, the foreman cuts them out with his penknife, and puts them into a queen-nursery (which consists of a number of small cages fitted into a frame), and this nursery is placed in a hive between the frames so as to allow the warmth from the bees to hatch out the young queens.

The next process in order is to get these queens mated, and it is done in the following way: as soon as one hatches out of its cell, it is taken out of the queen-nursery and secured to one of the combs of a nucleus by means of a cage. These cages are made of two and a half inch square perforated metal, turned down about half an inch all round, and when a queen is caged in one of these, it is placed over her and pressed into the comb, care having been taken however that the cells which it encloses contains some honey.

This introducing of a queen is an art in itself, and many a one have I lost before I learnt to be expert at it.

Were your subjects considerably larger and as hard as stone, it would be a comparatively easy task, but when you have to deal with a delicately made insect, considerable care and patience are necessary.

The young queen is left in the introducing cage for two days, and then quietly released. Now comes the trouble, unless, indeed, the bees are anxious to accept her, but if not, they will pounce upon her and try to sting her to death.

You must be pretty quick in such cases, for of course she has to be caught as soon as possible, and caged again for another forty-eight hours. If this has been repeated once or twice and the bees still refuse to accept her, then they (*sic*) resort to one of numerous methods which they have, either covering the queen with honey and allowing them to lick it off; shaking all the bees out on the ground, dropping the queen amongst them, and letting them enter like a swarm; or puffing fumes of chloroform into the hive just before uncaging her.

A queen will issue from the hive, to be mated, three or four days after she hatches out, and in three or four more days will begin to lay, so that the queens which have been introduced into the nuclei can safely be expected to lay eight day after they come out of their cells.

Mr. Jones' method in cases of natural swarming was this: As soon as the bees began to build queen cells, he would catch the queen, and with an ordinary pair of sharp scissors, clip off about a third of one wing. Then, when the swarm issued from the hive, he would watch till she came out, and catch her, it being easily done, as she is unable to fly. Next, an empty hive is placed on the stand of the old one (the old one being carried to some other part of the yard) and the queen is placed on the alighting board.

The bees having clustered on some neighbouring tree will soon discover that the queen has not followed them, and after a fruitless search will attempt to return to their old quarters.

Here of course they discover, not only a new house, but their queen already in possession, a general hum of satisfaction is heard, and all hands set to work before they have been in the hive ten minutes.

In Beeton, they commence extracting between the 25th June and 1st July, or as soon as the bees commence gathering from white clover.

When the honey yield from clover is done, they gather from the bass-wood tree, (1) which blossoms about 15th July and continues till about the 1st August. These are the two staple honey producers of that part of the country, in fact, one might say, the only two, for little or no honey is extracted before the clover is in blossom, and what is gathered after the bass wood is over, is used for the winter stores. The extractor is too complicated a machine to explain clearly without illustrations, therefore I shall not attempt it: suffice it to say, that two frames can be put into it at a time and the hon brown out by centrifugal force, without any injury to the contents of the cells (viz: brood and eggs) or to the cells themselves.

The following is a brief description of the extracting process. A frame containing honey is taken from a hive and (the bees having been brushed off with a feather) it is handed to a boy who carries it to the bee-house and passes it through a curtained window (this precaution being taken to keep the bees from robbing) to those within.

The first to receive it is the uncapper, his duty being to shave off the tops of those cells which have been sealed over, with a honey knife, and then pass them to the extractor.

This honey knife, one of M. Jones innumerable patents, is made expressly for the purpose, and is kept as sharp as a razor.

The extractor puts it in his machine, whirls it round for about ten seconds, takes it out and puts it in the other way, so as to get the honey out of both sides and after another whirl passes it back through the window.

Two frames are extracted at a time, and the honey is thrown out on to the sides of the can which contains the machine, a tap is fastened on the bottom, and the honey drawn off as soon as it get too full.

M. Jones raises little or no comb-honey, he finds the extracting process much more remunerative. Last summer he extracted thirty thousand pounds, or fifteen tons of honey. His greatest yield since he first commenced the business was seventy thousand pounds.

His hives averaged seventy pounds each last summer, but it was a poor season: from ninety to one hundred pounds per hive is what he expects in a good season.

The fall-feeding depends greatly upon the yield from the fall flowers, among which are the Ground Willow, Golden Rod, Boneset, Ashes, etc., etc., the greater the yield from these, the less he has to feed.

The food consists of the finest granulated sugar boiled to a syrup, with (parts) two of sugar to one of water, and is given when cold, by pouring it into a feeder which rests on the top of the frames.

One of the most important things in fall-feeding is to have it over as soon as possible, for feeding tends to make the queen lay, and all these eggs will mature sooner or later.

Now, it is very necessary that these young bees should have a fly in the open air before going into winters quarter, and, as the later they are fed the later the queen lays, so, if feeding is not over early in the season, a good many eggs will be in the hive when it is put away for the winter.

Mr. Jones feeds till his hives weigh sixty-five pounds each and then stops, he also reduces the number of frames to from six to eight. It is close upon the 1st November before he puts them away for the winter—depends upon the season—as soon as the hard frosts commence. The majority of his hives are

(1) Our English *Lime* Many a time have I lain under an avenue of these trees, at Chislehurst listening to the drowsy murmurs of the bees in the flowery month of June.—A. R. J F.

wintered in bee-houses, which consist of roughly boarded building containing two rooms, one above and one below. The one below, which is level with the ground, is the bee-house proper, and is surrounded by eighteen inches of sawdust doubly boarded on either side. The upper room is used for a workshop and general store room, a couple of ventilators passing through it from the bee-house below.

Well, I have tried to give you an idea of Mr. Jones different methods in apiculture, and I hope you'll find it sufficiently interesting to publish.

I only found, when I first began this article, how hard it was to describe these different methods briefly, and yet intelligibly. Were I writing to a Bee-Journal it would be very different, for I should take it for granted that my readers understood the management of bees to a certain extent, and confine myself entirely to Mr. Jones' management.

FRANCIS W. SKAIFE.

Thank you.—A. R. J. F.

Rock Island, Stanstead, Que., March 29th, 1886.

ARTHUR R. JENNER FUST, ESQR,

Dear Sir, —Permit me to make some enquiries, as regards the following subjects: I have plowed between 15 and 20 acres of old worn out pasture, and I shall dress with hardwood ashes from 50 to 60 bushels per acre, sow oats, and seed down with mixed grasses—lucerne and clovers, both red and white—cut hay one year, and then let it go to pasture again. Now, I wish to give it about 500 lbs of ground bone that I shall make at home. Would it do to sow it broadcast after I take hay off once, or must I put it on at the time of sowing and seeding down this spring and harrow it in? As I shall hardly be able to do it this spring in time, would it give good results to sow after the first haying, which would give me a better chance? A reply to the above from you will be thankfully received.

Very respectfully yours, &c.,

DAVID BORLAND.

Rock Island, Que.

P. S.—I have sold the farm that I lived on when you paid me a visit on your tour, and have purchased close by, and I intend to get my pasture all put in good order as fast as possible, for it is in a sad state.—D. B.

Please let me know your address, I am not certain of it; only running risk.

REPLY.—*Dear Sir*,—As to your questions about the manner of applying bone-dust, I beg to say that it will answer equally well if sown broadcast after the first haycrop is severed; provided always that it be reduced to a finish state.

What an immense quantity of ashes you propose to use! Twenty bushels would be quite sufficient for an acre. Why not mix them with the bone-dust, and damping them, allow them to work up the bone-dust into a pasty form. The mixture would act much more quickly.

Very truly yours,

ARTHUR R. JENNER FUST.

Canadian Hoed Crops.

The following is an extract from the Canadian Census of 1881. The acreage in corn and in root crops is not given, the return being in bushels only. In potatoes, both the number of acres and of bushels is given. I have estimated the root crops at 500 bushels per acre, which seems a fair average of all roots grown in gardens and in fields. The corn crop I estimate at 30 bushels per acre. With these estimates, we arrive at the figures given as representing the percentage of hoed crops in Canada. When summer fallows are so little practiced, and with such a small percentage as 3.94 % (less than 4 % of hoed crops) it is not surprising that weeds have such a range, and that the returns of grain crops are so small:

	Whole Dominion.	Ontario.	Quebec.	Maritime Provinces.	B. Columbia, Manitoba and N.W. Territories.
Total acres occupied	45,358,141	19,259,909	12,625,877	10,382,656	3,139,699
" " improved	21,899,181	11,294,109	6,410,264	3 730,674	484,134
Bushels of corn (maize)	9,025,142	8,096,782	888,169	24,294	5,897
" turnips	39,059,094	33,856,721	1,572,476	3,195,454	434 443
" other roots	9,192,320	6,479,222	2,050,904	528.058	134,436
" total root crops	48,251,414	40,335,943	3,623,380	3,723,512	568,879
" potatoes	55,268,227	18,893,996	14,873,287	20,381,594	1,129,350
Acres in potatoes	464,289	181,294	123,868	150,637	8,389
" in root crops estimated at 500 bush. p. acre	96,503	80,672	7,247	7,447	1 138
" in corn, estimated at 30 bush. p. acre	300 838	269,893	29,605	810	136
Total hoed crops per 100 acres	861,630	531,959	160,721	158,894	9 723
	Acres 3.94/100	Acres 4.71/100	Acres 2 5/100	Acres 1 26/100	Acres 2 07/100

Quebec.

BUTTER-MAKING IN WINTER.

PROFESSOR J. P. SHELDON.

Trouble in churning; requisites indispensable for prime winter butter; food of cows; temperature; causes of butter "not coming."

Why butter "does not come" under certain conditions, is a

puzzle that has defied not only practical dairymen and "maids," but dairy experts as well. Has sufficient notice been taken of the effect, in this connection, of the lapse of a considerable period since the cows have dropped their calves? Prof. J. P. Sheldon, author of the best work published on dairy husbandry, and a high authority on dairy matters, attaches a good deal of importance to this point in his instructive article in this issue of the RURAL. The "unknown in dairying" still covers a great many points, and sometimes the best dairy experts and operators must alike agree with the rhymester:

"I thought I knew I knew it all;
But now I must confess
The more I know I know, I feel
I know I know the less!"

EVERY dairyman and dairymaid who has been used to butter making all the year round, has had trouble at times in winter—trouble with the churning. For it is in the churning that the difficulty lies, most of all, rather than in preliminary and subsequent operations. The act of churning, indeed, is the leading and central feature in the domain of a butter dairy: and if that part of the ceremony passes off well, the rest is tolerably simple and almost certainly satisfactory. In any time of the year, in fact, everything else may be taken to be in order if only the churning is a success—everything preliminary, I mean. The mechanical operation of churning is, after all, in reference to winter butter, the leading test of the whole business, in the cow-shed as well in the dairy. If butter comes within an hour, it is usually a proof that the cream was in good condition, and that the cows were properly fed, it proves, too, that the temperature of the dairy was properly regulated, and that the cows, or some of them, have not been too long in milk.

It is hardly possible to make as good butter in winter as in summer; some say it is impossible to do so. But, in any case, there is one condition indispensable to the making of first-class butter in winter, viz.: the cows must have calved pretty recently. I do not believe that the best of butter can be made from cows which are six months after parturition; and in winter time the butter from such cows will, as a rule, be only tolerable at the best. Much depends, of course, on the system employed in feeding the cows, on the kind of food they get, and on the state it is in. One of the reasons why summer butter is, as a rule, the best of the year, is found in the sweet and fresh and succulent grass on which the cows are fed; and another in the rule that the cows are not long after parturition. These two reasons, indeed, providing the cows are well-bred for the purpose, are all-important—either in cheese and butter-making; and we may lay it down as an axiom that, all things considered, there is no cheese or butter equal to that made in June.

The condition and quality of the food given to cows in winter have a good deal to do not only with the quality but with the quantity of the butter produced. By "condition" I mean the measure of easy digestibility with which the food is endowed, its physical and mechanical state, and also the degree of succulency found in it. These considerations touch every thing by reason of which silage is superior to its equivalent in hay. Dessicated forage, as compared with the succulent vegetation from which it is made, is deprived of its condition; it is no longer easily digestible, it is no longer succulent and easy to masticate. The labor involved in masticating hay first and in digesting it afterwards, as compared with the ease and facility with which grass is masticated and digested, supplies an explanation of the general superiority of summer butter, and of the greater yield of it at that period. This however, is not the whole of the business, for isothermal considerations come in as well; and temperature is a condition we cannot afford to overlook, though to our loss we do overlook it a good deal. Given the same food, the same cattle, the same everything excepting only temperature: given also the same kind and quality of food, except that it may be dry and hard instead of succulent and soft: here we include a range of conditions, over and above the cow herself, which sufficiently accounts for the difference found in the quality and quantity of butter yielded in summer and winter respectively.

These considerations have a good deal to do with the trouble there is with churning in winter, though they are not the whole cause of the mischief, or even the chief cause of it. It may be said, in fact, that if the cows are in good form, and are decently fed there will be no very great deal of trouble with churning in winter after all. But when cows calve in April and May, or earlier still, and we try to make butter from them in the following winter, it is frequently found that the butter shows great reluctance to come in any reasonable time, and once in awhile will not come at all. And even when it does permit itself to be separated from its matrix of cream, it is almost always of inferior quality. Butter obtained under these conditions is similar to that which comes from the second and third risings of cream on milk produced under more favourable conditions. In both cases the butter globules are inferior in size, in color, in flavor, and in quality: for the longer the time a cow is in milk, the smaller are the globules, and in the case of milk of good quality the larger globules rise first, say in 12 hours or so, the smaller ones ascending afterwards, in a more take-it-easy fashion.

It is sufficiently obvious that these smaller globules, whether they come from inferior milk to start with, or from the later risings on better milk, will be more difficult to churn into butter than the larger globules which abound in the milk of Jersey cows, or in the milk of almost any other breed in the early months after parturition. Such cream, too, produced from dry forage in winter, is apparently in a condition, which, in a chemical, no less than in a physical sense, is inimical to easy churning. What this chemical condition is, in reference to what is known as "sleepy cream," does not appear to be well understood, if understood at all, and it remains a problem whose solution has already occupied a good deal of hitherto fruitless inquiry. It is not owing to acidity, or an alkali would alter it, and acidity in cream, indeed, commonly causes butter to come in less time than when the cream is fresh. Be it whatever it may, however, it may be taken for granted that an improvement will be effected by giving the cows a generous supply of food that is in an easily digestible condition. (1)

Surrey, England.

The South Carolina Phosphates.

It is becoming a well-understood fact that the phosphatic substances used in making artificial fertilizers must, in order to be rendered "soluble," be so diluted or extended that when the process is completed one barrel is made into two, and the cost to the buyer increased in at least the same proportion. The custom of analytical chemists in styling the natural phosphates—either bones or the mineral phosphates—"insoluble," has created a belief that the acid treatment is absolutely necessary to make them "available" as plant food. But that this belief is not founded on fact is becoming known to cultivators by the successful use of ground bones

(1) See my article, on p. 67 of this number, concerning the matter treated by professor Sheldon, A. R. J. F.

in their natural condition. These are everywhere known, now, to be strong and active fertilizers of all farm crops, especially when combined with the wood ashes or potash salts necessary to make them complete fertilizers.

But though driven from this stronghold by the power of facts, the asserters of the uselessness of "undissolved" phosphates have rallied behind a new breastwork, somewhat in the rear of their former position, and now declare with equal positiveness that though bones may be used to advantage, "sometimes", without being dissolved with acid, the mineral phosphates, no matter how finely powdered, are of "no more value than so much sand" when applied to crops as a fertilizer.

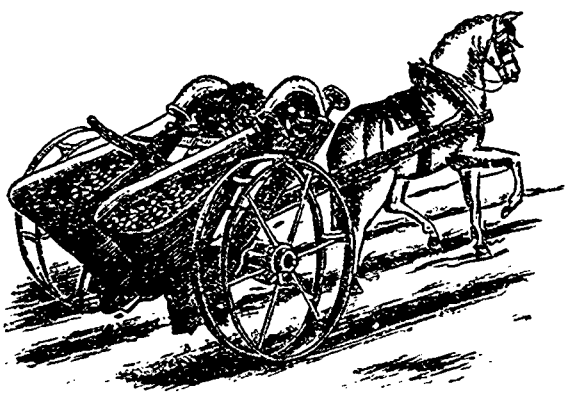
We have as strongly doubted this assertion as we doubted the other, and last summer we put the thing to a practical test, as detailed in the following paragraphs, recently contributed by us to the *New England Homestead*.

Last spring I determined to begin experimenting, to settle the matter for my own satisfaction and advantage. I have long been using ground bone and bone ash with perfect success and large profit as fertilizers in my orchard and gardens, and I never could see anything in the analysis of South Carolina rock to justify the belief that it is any less soluble or "available" as a fertilizer than those articles. And, furthermore, no chemist has shown that the phosphoric acid of our rich natural soils exists in any more soluble form than in the softer mineral phosphates. So I ordered a bag of "floats" [South Carolina phosphate rock ground to an impalpable powder] from the local agent of the Bowker Fertilizer Company, and selected for the trial a strip of land between two rows of trees in a young apple-orchard. The central twenty feet in width of this strip was laid off into six rows, the five interspaces being each four feet wide. The land had received no stable manure for several years, but had been moderately dressed with bone fertilizers and planted with garden peas, beans and early potatoes for market. Enough of this fertilizing material remained in the soil to raise it above barrenness, but not to fit it for a crop. It was very uniform in its condition, as had been shown by previous crops.

I proposed to make the test on both corn and potatoes, three rows of each, and I divided the strip crosswise into three equal sections of one hundred feet each. The two end sections were dressed in the drills with Bowker's Hill and Drill Fertilizer, and the middle section with a mixture of floats, unleached hardwood ashes from my own fires and sulphate of ammonia, calculated to give precisely the same composition, as regards phosphoric acid, nitrogen and potash, as the Hill and Drill Fertilizer as analyzed at the Massachusetts Experiment Station. As most readers are aware, the last spring and early summer were very dry—with me so dry that toward the end, at the time when the corn was beginning to show the point of the tassel within the circle of the inner leaf, and the potatoes were budding to bloom, the soil to the bottom of the furrow in my light ground would run out between the fingers from the closed hand. At the end of that dry spell, just before the rains came, the parts dressed with Hill and Drill were clearly ahead in growth, so that the middle section, where the floats were applied, viewed crosswise, was plainly lower than the two end sections. There was, however, no difference in color.

The last week in June the drouth was broken, and from that on there was rain enough. In ten days no difference could be seen in the two sections, and as the time of harvest approached repeated examinations showed that the corn (Early Dean Sweet) and potatoes (Snowflake) were ready for use at the same time; and finally the ripe crop was quite uniform the whole length of all the rows.

But our single experience is not obliged to stand alone in this matter. In one of the recent monthly reports of the South Carolina Department of Agriculture there is an important paper by Baron H. von Liebig, translated by Professor Guerard, on "Raw Ground South Carolina Phosphate or 'Floats.'" This able agricultural chemist declares that the greater efficacy of the dissolved phosphates consists only in their fineness when they enter the soil. He adds that it stands to reason that the higher the degree of fineness of the raw phosphate is, the nearer it is brought to the dissolved i manurial effect. But experiment has shown that raw ground phosphate of far coarser mechanical condition than that produced from the South Carolina phosphate was only ten per cent behind precipitated phosphate, when used in quantities of not less than one hundred pounds of phosphoric acid to the acre. Baron Liebig then shows that fine grinding adds materially to the manurial value of raw phosphate, making it indeed nearly equal in efficacy to dissolved phosphate, because it is thereby enabled to yield a larger per cent of its phosphoric acid South Carolina phosphate, passed through a sieve of forty meshes to the inch, yielded 23.6 per cent of phosphoric acid. Passed through a sixty-five mesh sieve it



MURRAY'S TWO-ROW PATENT POTATO PLANTER.

gave 3.68 per cent, while a one hundred thirty mesh sieve enabled it to yield 76.4 per cent. All of the fine ground South Carolina "floats" tested by him passed entirely through the one hundred thirty mesh sieve.

The inefficacy of "insoluble" phosphates, Baron Liebig goes on to say, especially in poor soils, is caused often by a want of potash in the land. This constituent should therefore be supplied to the soil along with the phosphoric acid, and that is exactly what we did, making a complete fertilizer by also adding the proper proportion of nitrogen in the form of sulphate of ammonia. We sincerely hope that experiments will be made all over the country, by experiment stations, agricultural colleges and intelligent individual farmers, to the end that we may all get our phosphatic plant food in the cheapest available form. "Floats" cost, delivered in Vermont, from $15 to $19 per ton, and they contain just about twice as much phosphoric acid as the average commercial superphosphates. In a future issue we will give detailed directions how to prepare and apply these "floats" to the crops successfully. They are called "floats," by the way, because the rock is so finely pulverized that it floats in the air, and after settling on the floor of the stamping-room is put up for sale. It is fully as fine as flour. (1)

DR HOSKINS.

(1) All right. But I should mix some good plain superphosphate with the floats to start the crop. A. R. J. F.

WOBURN EXPERIMENTS.

The results of the Woburn experiments, now that the crops have been threshed and weighed, show that the wheat harvest of 1885 was less prolific than that of 1884. The unmanured plots, on which wheat has been grown for the ninth year in succession, gave 21.3 and 21.9 bushels per acre respectively, against 23.1 and 26.6 bushels last year; and the increase from the use of various manures was less this year than it was in 1884. Mineral manures alone, as heretofore, have not increased the yield more than about a bushel per acre; while the plot dressed with 200lb. of ammonia salts per acre yielded 31.2 bushels, and that receiving 275lb. of nitrate of soda produced 28.1 bushels. Minerals with 200 lb. ammonia salts produced 37.5 bushels, and with 275lb. of nitrate of soda 38.9 bushels per acre. With the ammonia salts doubled and the minerals the same the produce was 41.1 bushels, and with the nitrate doubled and the minerals the same the yield was 40 bushels. The increase from the extravagantly large quantities of manure failed, as on previous occasions, to pay for the extra expense. On the whole, there is scarcely any difference in the results from the use of ammonia salts and nitrate of soda respectively as far as grain is concerned; but much more straw was grown with the nitrate. The falling off in produce where nitrogenous manures were withheld for the first time, after having been liberally applied in previous years, was again very large, showing how temporary the effect of these powerful fertilisers is. A more remarkable result is the sinking of the yield to 19.3 bushels per acre in one case, and 20.1 bushels in another where farmyard manure had been given yearly up to 1882, and since withheld, the yield being less than that of the continuously unmanured plots. On the barley plots the yield was also smaller than that of 1884 where no manure has been applied for nine years. Nitrate of soda beat ammonia salts for barley, no less than 64.5 bushels per acre having been obtained from a plot which received 550lb. of nitrate with minerals, as compared with 58.7 bushels where 400lb. of ammonia salts and the same minerals were applied. Proportionately, the comparative results were similar where smaller quantities of the nitrogenous manures were used. Minerals alone gave no increase over the yield of the unmanured plots. The rotation experiments, intended to test the respective manurial effects of maize, meal, and cotton cake, consumed by cattle or sheep, as heretofore, gave no instructive results, the meal beating the cake in the experiments with wheat. But the total collapse of this experiment is most distinctly shown by the fact that when the much higher equivalents of cotton cake were applied to wheat, the yield was smaller than where the less fertilising equivalents of the maize meal were used. The only possible conclusion is that the land is so full of fertility as to have no need of the extra fertilisers.

The fall in the values of pedigree cattle appears to have affected the polled Angus and Galloway breeds with exceptional severity. A few years ago there was a great run upon these animals, in consequence of the brisk demand in the United States for hornless cattle, obviously desirable where great herds roam at large. Recently this demand has been growing smaller and smaller, until it has almost entirely ceased, as it has also in the case of Herefords, now selling at little more than half the values current a year or two back. The *Aberdeen Free Press* has tabulated the sales of pedigree polled cattle for 1885 and the three preceding years, showing these results:—In 1882, 341 animals averaged 62*l.* 18s. 6d. per head; in 1883, 242 sold at the rate of 48*l* 8s, in 1884, 733 at 36*l.* 12s. 11d.; and in 1885, 885 at 25*l.* 14s. 1d. The great increase in the numbers sold in the last two years shows either that the high prices current a few years ago led to increased breeding, or that the drop in prices has induced breeders to reduce their herds.

"A PROFIT IN HER OWN COUNTRY."

The following amusing account of a recent publication by M. Leroy has appeared in *The St. James' Gazette*:—

The antithesis of that story about St. Francis preaching to the birds is perhaps to be found in "the symbolic hen" at Islington, of whom Carlyle took counsel one morning some 60 years ago. She was "a trim and rather pretty hen, actively paddling about and picking up what food might be discoverable; a two-legged creature with scarcely half a thimbleful of poor brains," but eminently of the direct business habits to which Carlyle was then trying hard to break his own "nobody knows how much" brain. And this is the hen of which M. E. Leroy, the well-known French breeder at Senlis, has long been in quest, and has at length found. In the second edition of "La Poule Pratique," just issued, he pronounces deliberately against all the fancy breeds, in favour of the "common hen," as being best suited both for farm and pen.

In the first place, he dethrones all the Brahmas, Cochins, and Japanese Negroes which had value in the eye of the expert only—because of their unusual brooding instinct—for hatching the eggs of the Spanish, Houdan, Padua, and other non sitting hens; but now that artificial hatching has been brought to such perfection, they have become the fifth wheel of the coach. As for beauty, and feather, and shows, and prize-winning, all that is mere artifice—mere empty fashion and "fancy," resting on no solid ground, and quite out of the reach of the vast majority.

The "common hen" is the barn-door fowl of the place where you live. Of course, all the fancy breeds are or have been barn doors somewhere—the Houdans immemorially in Beauce, the Dorkings where the famous battle was not fought, the Crèvecœur in Normandy, the Spanish in Iberia, and so on; but M. Leroy contends that for the most part when a breed of poultry is transplanted it goes off. Where it developed as a barn-door fowl it became by natural selection the fittest for the place; but when you take it out of that habitat, you start it on a fresh phase of development, which begins by upsetting the previous results. He instances the Dorking which—as is quite true—dwindles in France, while it is a very practical race indeed in parts of England. The Crèvecœur too, when taken from the Norman fields and grassy orchards to other climates of France, soon falls away in a similar manner. The hen is a profit only in her own country. The Houdan was first pushed into notoricty by the earlier patentees of incubators, who found it to their hand at and near Houdan; and Baron Brisse made its fortune by proclaiming it the best table-fowl. Hundreds and hundreds of thousands of its eggs have been hatched by artificial means, for it won't sit itself. Before incubators were perfected, great numbers of hen turkeys and capons were trained to spend their wretched lives hatching Houdan eggs in Beauce. But there is no fowl more difficult to keep up to its good points. Out of 200 chickens there may not be, perhaps, more than half a dozen pre-eminently fitted to continue the breed. The blood must be renewed every two years, and thus the Houdan, if left to itself, would soon become lost. They are essentially pen-fowl, are great eaters, and unsuitable for a farm.

The Brahma lays ridiculously few and small eggs, is ever hatching, and differs little from the Cochin, which is bad eating and all bones. The Langshan is superior to both. True, the hens sit too often; but they give great big chickens, which rival turkeys on the spit, for the Langshan puts up a

wonderful breast of white and excellent flesh. The chickens are hardy too, and the hens lay in winter, though the eggs are not very large. The race thrives well in pens, and M. Leroy recommends it for amateurs, of whose gains, by the way, he has but a low opinion—for the year is long, and laying is short; putting these gains chiefly in the occupation and amusement, and saying that an amateur can buy eggs and fowls in the market as cheap as he can produce them, and with more certainty. To be sure, if you turn your chickens to as good profit as the augurs did—if you can get long prices for prize fowls and their eggs—it is another matter. But how many are there who can do that? asks this practical man, who comes back again to his business hen as being the bird that all day ranges the fields and copses of the farm, that gains most of its own livelihood with its own beak and claws, that defends itself and its brood against all enemies, that lays good-sized eggs and many of them, and gives palatable chickens for the table.

What, then, is the best hen for the farm? M. Leroy passes in review a choice of notable breeds, which he pits against his elect. First in order he puts the black Spanish, for their excellence in laying immense eggs (which, in fairness, should sell by weight and not by number), their hardiness, and their cleverness. But they do not hatch (though that is an extra good point if you work a hatching-machine), they eat much, and, as table-fowl, they rank among the inferior breeds. But there is a splendid variety of the Spanish which M. Leroy passes over, which possesses all its practical qualities, and beats it by far in size and flesh—a common hen, too, in south-western France, at Barbezieux in Angoumois. For centuries this variety has given some of the best capons to the Parisian *gourmet*. But, as the Spanish that he knows is inferior in meat, M. Leroy rejects it.

Next he places the pencilled Hamburghs, golden and silver, which the French call Campines. They are small, and two of them will not eat more than a single Houdan. They are wonderful layers, but the eggs are so little as to be tire some to eat from the shell. The race is hardly, the flesh is good, and this is a recommendable breed. But why go so far afield when you have what is wanted at your own door? M. Leroy, in speaking of his common hens, means mainly these of Central and Northern France; but his remarks apply elsewhere, and especially in England.

In the first place you must begin by selecting, and continue by weeding; constantly rejecting the bad specimens, which are common enough everywhere, and retaining only those that exhibit the best qualities, whether for laying or putting on flesh. And at the very start you will find yourself in considerable difficulties: for the old barn-door is now getting so mixed by the thoughtless introduction of unsuitable new-fangled fowls of all sorts into the farm-yard, that it takes a good eye to pick and choose. If Darwin was right, that "not one man in a thousand has accuracy of eye and judgment sufficient to become an eminent breeder," it is not every one that can hope for success even with barn-door fowl. The next thing to be done with your well-chosen hens is to renovate the breeds by an occasional cross. M. Leroy's ideal cross is with the wild Bankiva cock, and here—surely without knowing it—he is at one with Darwin, who wrote: "Having kept nearly all the English breeds of fowl alive, having bred and crossed them and examined their skeletons, it appears to me most certain that all are the descendants of the wild Indian fowl *gallus Bankiva*." In default of the Bankiva—which, unknown to M. Leroy, is, we believe, to be found commonly enough and in good fettle in Devonshire and the West, under the name of the "Indian Game"—this successful French breeder recommends the big English Game fowl; and were it not for the special difficulties of keeping and rearing it, this—"le grand Combattant Anglais"—is clearly M. Leroy's private weakness: a foible which he shares with not a few of our own "knowing ones." He cannot say too much for the size and number of its eggs, the deliciousness of its meat, its hardiness, and its hardihood. "Go to the other side of the Channel for them," he writes, "where purity of breed is a religion with the fanciers;" and thus must the common hen be renovated from time to time. And M. Leroy winds up by saying; "Breeders, my colleagues; amateurs; farmers: For the pen and the farm, for the omelette and the spit, there is but one hen—and that is the barn-door."

CARE OF HONEY FOR MARKET.

R. F. Holterman, Ontario, argued that our extracted honey is exposed to the air too much after it is extracted, and thereby loses its fine aromatic flavor. Comb honey should be kept in a dry, warm atmosphere.

D. A. Jones, Ontario, did not think the capping to cells was impervious to moisture; if the honey was stored in a damp atmosphere, it would absorb the moisture, and burst from the cells.

H. R. Boardman thought comb honey thickened by age; it even becomes so thick as to crystallize.

Prof. Cook explained the difference between evaporation and crystallization. Honey can only thicken by evaporation, and to evaporate, it must have air; therefore the sealing is not air-tight. Crystallization is a different affair, and is akin to the formation of ice, resulting from the cooling process.

H. R. Boardman kept his honey room at a high temperature, with plenty of ventilation. On wet days he kept the room closed, and sometimes even built fires. He had even put lime upon the floor to absorb the moisture.

E. W. Thompson, New-York, had trouble with the bee moth larvæ in his comb honey. One trouble in fumigating with brimstone is getting enough to kill the larvæ, and yet not discolor the honey.

C. F. Muth said the fumes of burning sulphur will settle. The honey should be at the bottom of the room.

H. R. Boardman said that in fumigating, we should use nothing to ignite the sulphur that will cause smoke.

S. F. Newman thought many of these troubles came from removing the honey from the hives too soon. In the hives the honey is safe from the moths and from dampness.

J. B. Hall said the reason Mr Thompson has trouble from moths, is because of pollen in his sections. To fumigate honey, put some ashes in an iron kettle, then the sulphur; hang the kettle near the top of the room, then drop in a piece of iron heated to a white heat, and close the door. The temperature of a honey-room should be kept at 90°.

Dr. S. C. Whiting, Michigan, said that when he had some old honey that he wished to put upon the market, he placed it upon a hive containing a strong colony of bees, and it was soon so changed that it could not be distinguished from new honey.

G. M. Doolittle, New-York, mentioned the case of a bee-keeper who kept his honey all winter in his sitting room near the coal stove, and it kept well, and sold for as much the next season as did new honey.

James Heddon, Michigan, said that if we wished to keep honey from candying, it must be kept where it is warm; "we have no trouble with moths, and I do not believe they can be reared on wax alone. The cappings may contain some pollen."

C. P. Dadant: "Moths will starve in wax."

D. A. Jones: "Have not Messrs. Dadant and Heddon seen moths in cakes of wax?"

Sames Heddon: "Much beeswax, in cakes, contains large quantities of pollen."

Prof. Cook: "No creature can be reared without nitrogenous food." W. Z. H.

EDUCATED FARMERS.

I have just read in your paper of the 5th inst. a most interesting article on the above subject, at the end of which you kindly welcome us farmers to try our hand at letter writing, so I send you a few observations that have come under my notice. Education is of vital importance to us, not only in our every day work but in grasping those scientific discoveries made known to us through such papers as yours by our leading men. Perhaps, however, through our want of education, and sometime through other causes, it is very hard for some of us to reconcile the statements of such men with our actual experience; but if we make the best use of the offer you give us it will prove the best school and the best education we can have. Now the subject I wish to touch upon, and which is plain enough to most, especially the scientifically educated, is the composition of our green crops. We are told that they contain 80 or 90 per cent. of water—more or less according to the different crops—that the larger the roots the more water they contain. Now I am not going to contradict that, but confine myself to a few observations.

1. I had a field of clover, the first crop was safe in the stack, a portion of the second crop—a good one—was cut and carted to the stables, the rest was intended for winter use. When we had cut half for that purpose it came on so showery that we left off cutting, and did our best to save what we had cut; but we failed to get it fit for stacking, so ploughed it in. We ploughed the whole field and drilled it with wheat, the wheat on that portion where the clover was ploughed in green or uncut, was by far the best from the time it came up to the time of harvest. That portion where the clover was ploughed, which had been cut and withered, was but little better than that portion which had the clover carted away; and that made me think the 80 or90 per cent. of water should have another name, and I called it juice. For I was at dinner when I was thinking the matter over, and I wondered how much water there was in the syrup of the plum pie I was enjoying, and I thought whether it was much or little—it was very good; and I saw the tart made with the largest plums off the same tree made the most syrup, and I liked it best.

2 I had a lot of beasts in my yard. After it was littered with straw every morning and night, we threw half a cartload of swedes about, and I noticed they all looked out for the largest; and afterwards, when we commenced with mangolds, I noticed they did the same; and it was the same with the sheep, they picked out the largest first, and preferred the long red to the yellow globe. I have noticed that when we had good crops of swedes the sheep have done much better than when we had a poor crop, although they had the same quantity; and I have noticed that the ewes and lambs have done better in spring when we had crops of large roots—of mangolds. I might now ask several questions:—1. What difference, and if any how much, between the water contained in our green crop and the water we get from the pump? 2. Does a plentiful supply of manure, combined with a good season, lead to the formation of excess of water in our green crops? and (3) if so, in what proportions? LOUGHBOROUGH. (1)

(1) I am afraid to say it, but I must agree with Loughborough that we do not yet know all about our root-crops. A. R. J. F.

NON-OFFICIAL PART.

IN NEW QUARTERS.

Messrs. LORD & THOMES, of Chicago, the well known and popular Advertising Agents are about to move into new quarters, which are so spacious, so elegant, and so original and novel in their appointments, that they deserve more than a passing notice.

The building, Nos. 45, 47 and 49 Randolph St., between State and Wabash Ave., is at once the most striking in appearance and the most elegant in Chicago; built of sandstone, it is 70 by 174 feet, practically fire proof, and lighted on four sides. Three large elevators and two spacious stairways, give abundant facilities for passengers and freight.

Messrs. LORD & THOMAS will occupy the entire third floor, giving them a superficial area of nearly 12,000 square feet. This beautifully lighted room is unbroken by partitions, save a private office in one corner, thus bringing the entire working force of about sixteen clerks into one spacious room, certainly the largest office of any avertising agency in the country, if not the largest business office of any kind on the continent.

The various departments are so arranged, that the work passes along with almost mechanical regularity.

While the entire appointments are elegant, the filing department is arranged on an entirely new principal, which amounts to an important invention. Heretofore Advertising Agents have filed their Newspapers in wooden pigeon holes, which not only excluded the light, but caught and retained the dust, and thus proved a nuisance. The new filing department of Messrs. LORD & THOMAS is made entirely of wire work; a separate compartment is made for each Newspaper, Magazine and Periodical in the U. S. and Canada, about 14,000 in all. The various sections are suspended from the *ceilling, and hang clear of the floor, leaving a space under* each one so that the entire floor can be swept.

Space will not permit us to describe this important improvement in detail. The principles upon which it is constructed will be covered by letters patent.

The National Wire and Iron Co., of Detroit, Michigan, have been awarded the contract of the work, and are rapidly pushing it forward to completion.

Our friends who wish to see a copy of our paper when in Chicago, can always find it on file at the Agency of Messrs. LORD & THOMAS.