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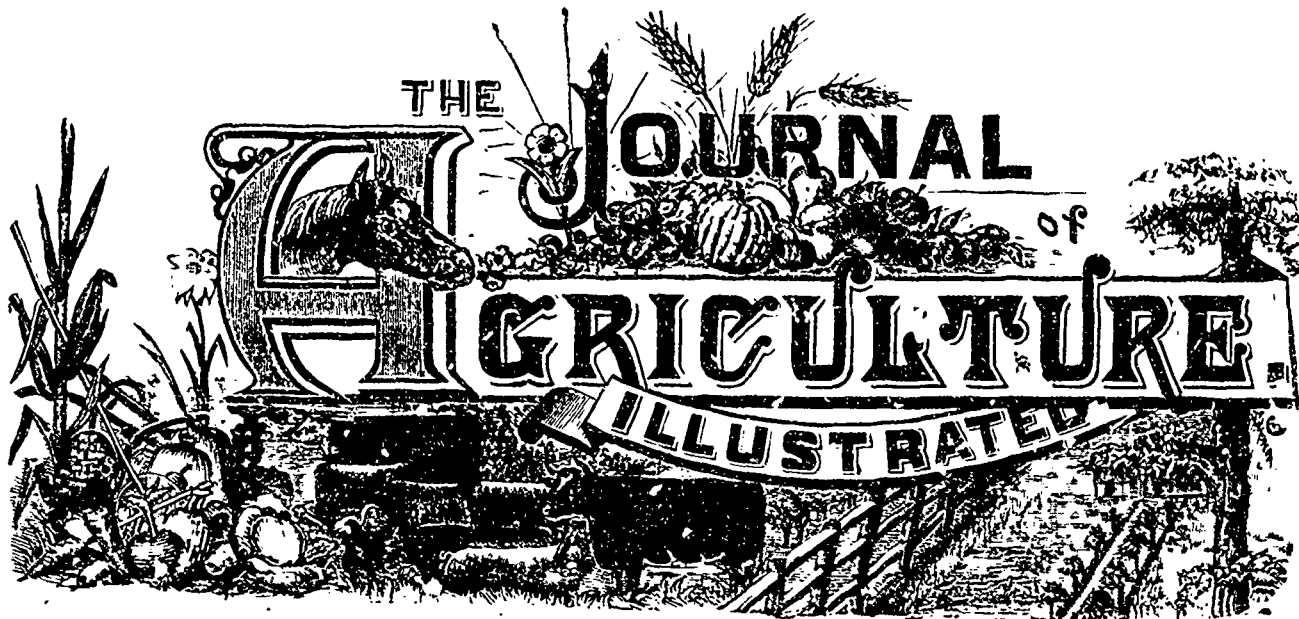
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The Ensilage Convention.

The Meeting of the Ensilage Association took place at the Star Office St. James Street, Montreal, on Thursday, March 17th, and was attended by a large number of representative farmers from all parts of the country. Messrs. Ewing, (president), Beaubien, (Com. of Agriculture), Robertson, Barnard, and many others addressed the meeting. A full account of the essays and discussions will appear in the next number of the Journal.

A. R. J. F.

The late Thomas Brown, of Petite Côte.

It is with much regret that we chronicle the death of Mr. Thomas Brown which occurred at Broughton, Scotland, on the 11th February. Till within a year Mr. Brown was a typical specimen of the hardy, rugged Scotch farmers and a good example of that class of Agriculturists who by their intelligence, industry and perseverance have done so much to promote farming interests in all parts of the Dominion.

During last summer his health began to fail, but his pluck and courage enabled him to keep up and attend to his duties when he was far from able to do so. In the autumn he had a longing to return to his native land, which he loved so dearly, though in a feeble condition to undertake such a journey he started with a strong hope that the sea voyage and a rest in the home of his childhood would restore him to health. In this he was doomed to disappointment for he gradually became weaker till death claimed him.

The news of his death was received with deep sorrow by his many friends here. A man of sterling and independent character, and one who possessed the courage of his convictions, he was ever ready to sustain the cause he advocated and to defend the right. His natural abilities added to his straightforward and manly character soon gave him the position of a leader among the farmers of his neighbourhood and his influence was always exerted on the side of their progress and advancement. Mr. Brown came to this country about twenty five years ago and during the last 12 years rented a farm at Petite Côte, near Montreal, where he was very successful. He was one of the foremost stock raisers in the province of Quebec and one of the best known in the Dominion. He was a prominent figure at all the leading exhibitions in the country and with his Ayrshire cattle and Clydesdale horses was a very successful competitor in the prize ring. His collection of Ayrshires is unquestionably one of the best in the Dominion and there are probably few, if any, on the continent of America that excel it. He had a great ambition to excel in this line and in 1888 he went to Scotland and purchased "Nellie of Barcheskie," the winner of the Queen's prize at the Royal Windsor Jubilee Show, an animal which was justly considered the best Ayrshire cow in the United Kingdom. He was proud of his calling as a farmer and was a credit to his craft. He was a lover of nature and a genuine admirer of Robert Burns whose poems were very familiar to him and often on his tongue. His death is a loss to the County of Hochelaga and to the entire Dominion. His name was often mentioned in connection with the Council of Agriculture and, had his life been spared, he would no doubt have been called to take his seat at the Board. The valuable Ayrshires and Clydesdales which belonged to Mr. Brown are shortly to be sold by auction.

DE OMNIBUS REBUS.

February 26th 1892.

Permanent pasture—Mr. Wm. Evans has promised me to have some genuine "Pacey's perennial rye-grass," of the crop of 1891, for sale this season. He will I hope, have plenty of sale for it, as I am sure, from what I hear about its success in the States towards the north, it will do well here if—and that is a large if—the land is properly prepared for it.

If we are going largely into the butter-trade, I cannot see how we are to succeed without permanent pasture. Clover, it is true, will make plenty of milk, but good-flavoured butter, such as will command the highest price on the London

market, cannot be made without the cows get a variety of foods, and, on pasture, that variety can only be had by sowing a variety of grasses.

As I have often remarked in this Journal, every one who tries laying down grass for the first time, gets worried, almost thrown into despair, by the shabby appearance the new lea bears during the third and fourth year after sowing. Even in the moist climate of England the same drawback manifests itself. But there is no need to be discouraged; it will come all right in time. The grasses sown, if any of them are unsuitable to the soil or climate, will indeed die out, but the others will gain strength by their removal, and the additional space afforded will enable them to establish themselves firmly in the soil.

In the meantime, many of the grasses native to the land, the seeds of which may have been lying dormant for want of air, will have burst into life; and, in spite of the prognostications of those who want to keep on in the old rut of "clover and timothy," the barer spaces will before long be filled up, a good close bottom will be formed, and in July and August, instead of the cows wandering over acres of timothy stubble—for it is often nothing else—picking up, here and there, a scanty mouthful, I was going to say, but they never get a mouthful—bite, half root, half dirt, the "milky mothers of the herd" will luxuriate on a plentiful supply of nutritious herbage, the mixed flavour of which will not be wanting to the butter or cheese made from their milk.

Upon the whole, I do not think it advisable to sow many of the seeds recommended in the dealer's lists. Four sorts, besides the clovers, will be amply sufficient. A very good mixture of grasses that I know will stand the climate, for I have tried them all, is the following:

Pacey's Perennial rye-grass	$\frac{1}{2}$ bushel.
Orchard-grass	$\frac{1}{2}$ do
Lucerne	3 lbs
True cowgrass	3 "
White clover	2 "
Alsike do	2 "
Timothy	4 "

The lucerne will probably be the first to die out, as the crowding of the other plants will not suit its habits, but the first year or two it will add largely to the yield of the pasture. The cowgrass, as valuable in its way as red-clover, with the white, will certainly last for several years, *if fed*; and from what I observed in my experiments at Laohine and Sorel, the orchard-grass and the timothy will be the last to go.

You may fancy, my dear readers, that I have given you an extravagant lot of seed to sow: it is not the case, I assure you. Small, stinging seedlings of grasses never turn out well. You will, of course, scatter the seeds at twice: the rye-grass and orchard-grass at one cast together, and the clovers and lucerne afterwards. Care in mixing both lots will pay.

I need hardly say that the land should be well wrought and well dunged before a permanent pasture is laid down. After potatoes, corn, or roots, grown with a heavy manuring, is a good position for the grain-crops with which the grass-seeds are to be sown. Harrow the fall-furrow before putting in the grain until you are tired, and then harrow once more; sow the barley or wheat—grass-seeds do not seem to do well with oats; why, I don't know—and get the grass-seed in at once after the last harrowing, covering them with a chain- or a bush-harrow, followed by the roller. The great fault of the cultivation of this province is that it is always done in a hurry. People do not harrow half enough, to say nothing of the way in which the ploughing is—shall I say, *scamped*? I remember well, at Compton, the foreman of the late Col. Pomroy telling me that he generally ploughed $2\frac{1}{2}$ acres a day, but that he had got over $3\frac{1}{2}$ acres! Ask—I don't say an Eng-

lish farmer—but ask Mr. Tom Irving or Mr. James Drummond how much their men plough a day, on an average, and they will reply: an acre or, at most, an acre and a quarter.

And, as far as I can judge, there are very few farmers here who know the value of a grubber or scarifier. Why, half the ploughing might be saved by a judicious use of this invaluable tool. On the heavy clay soils, the plough should never be used in preparation for grain- or root-crops in the spring. A good, deep fall-furrow, with the *crumb-furrow* well laid up—not left unploughed as we see it in the narrow ridges of the St-Hyacinthe district—and packed close, the water-furrows well cleared out, and the field kept clear off cattle, and there will be no more need of the plough's services until the following autumn; and not then, in the case of the land we are lying down to permanent grass. Why bury the fine mould the frost has made, and bring up a lot of clods? Far better harrow the land well; put the grubber through, along and across; sow the grain with a drill, if you have one, if not, cover with the grubber again, and then with the harrows, and finish the work always with the roller. For roots or corn, grub several times, harrow and roll until the surface is fine, and then sow in rows on the flat. In this case, the manuring will of course have been done in the autumn. If spring manuring be necessary, I suppose you must use the double-mouldboard plough and make drills to receive the manure; but I am convinced that, on heavy land in this hot summer-climate, sowing on the flat is infinitely preferable to sowing on raised drills, and much more easy of execution.

I would not mow my permanent pasture at all. Feeding off when young and keeping the grass level-fed, is far better than letting the blades grow tall and cutting them. Look at the Sherbrooke Street lawns. They are kept close-cut by the machine, and never allowed to grow above two inches high at most; and would any one desire to see a finer, thicker *bottom* than they show? No sheep should feed on our young grass for the first two or three years, and no stock should be allowed to trample and poach the pasture in wet weather. Would it be asking too much to beg that the droppings of cows and horses be knocked about now and then? Chain- or bush-harrows should be passed over the pasture every spring, and a heavy roller afterwards.⁽¹⁾ What ever ditch-scrapings, pond-mud, or other stuff you may have at hand may be turned up with a moderate share of dung, and spread on the grass in the field. The finely ground Indian bone-meal would help the pasture amazingly, but, best of all, and I firmly believe the most profitable of all means of feeding the grass, would be to give some additional food to the stock while on it. It does not signify what it is you add to their rations of grass: linseed or cotton-seed cake, pease-meal, corn-meal, bran, crushed oats, &c., will all answer your purpose.

Deep-ploughing.—One great advantage we shall derive from the proposed extension of the cultivation of sugar beets in this country is the suppression of the theory so commonly held as true here, that deep-ploughing is in all cases injurious to farm-crops. I say to *farm-crops*, because even the shallowest of ploughmen turn up their *gardens* to a fair depth. The Brabant plough, with which my young friend, the Comte des Etangs, intends to work up the beet-crop land he contracts to manage, turns over a furrow of 12 x 17 inches, or even deeper still, and as that is in the same proportion as my favourite 7 x 10, I fancy it will lay the ground in a proper position to benefit to the utmost possible degree by the pulverising effects of the frost. This, then, will show if deep-ploughing tends to increase or diminish the yield of the root-

crop, and the subsequent grain-crop will prove an indication of its effects on the straw-crop. No one, that I know of, proposes to plough deep for grain, or indeed for an unmanured crop of any kind, or to plough anything but an ordinary depth in the spring; but a good deep furrow in the fall, well set up at the proper angle, I must be pardoned for thinking to be the best preparation possible for the crops in the whole rotation. (1)

I remember meeting a Mr. Hora, a farmer near Kingston, Ont., who did not believe in fall-ploughing. I went to look at his farm, and I found that his fall-ploughing had been done thus: a broad, shallow furrow, about 4 x 9 inches laid over, necessarily, nearly flat; and the snow, and the rain, and the thaws, had beaten the crest of the furrows, such as they were, down level, so that the harrows had nothing to lay hold of. And yet many people "don't hold with fall-ploughing"!

Spring-lambs.—It is a pitiable sight to look at some of the lambs hanging up in the butcher's shops in Montreal at this season.⁽²⁾ Miserable little things, weighing about, at the outside, 3 lbs. or 4 lbs. a quarter; in fact, I have seen some Norfolk hares very nearly as large. And it is not as if the butchers would not pay a good price for good things—if they could get them.—On Tuesday, Feb. 23rd, two lambs were sold in the market which fetched, one, \$9.50, the other \$8.00! The higher priced one was said to be two months old, i. e., it was lambed on, or about, Christmas day. Now, allowing its residence in its mother's womb to have cost \$1.50, it is evident that the lamb paid a dollar a week for its keep from the time of birth. Profitable enough, this rearing of spring lambs, if they are properly looked after.

This is not a job that is easily overdone, either. It requires too much nicety in feeding and ventilation to be very popular. The sheds must be kept as clean and sweet as a lady's drawing-room, and though the air must be let in freely, the cold must be kept out. All the old "house-lamb" breeders of my day, even as long ago as the "thirties", used to have at least one thermometer in the shed, even in the mild climate of the S. E. of England. (3)

The best food for early lambs is half linseed cake and half white pease: the former fattens, the latter firms the flesh. We generally used to kill at about from 10 to 12 weeks old—not the house-lamb, for I never grow any—, by which time, with plenty of the food I mention, a lamb of the Hampshire-down breed ought to weigh 4½ stone (38 lbs.) the carcass.

Here, of course, all the early lambs must be kept in doors till they are sent to market, and I think that any one who sent up weekly to Montreal, from about the beginning of March to the 1st May, a couple of lambs of decent weight—say, from 28 lbs. to 32 lbs.—well fattened on firm trough-food, would not repent him of the exertions they had cost him when he came to settle up with his chapman.

I am *told* that the lamb above mentioned as having brought its proprietor \$9.50 weighed, dead, 24 lbs.; therefore the butcher must have paid 40 cents a pound for him!

Sheep in England.—In a late number of the *Vermont Watchman*, Dr. Hoskins, talking of sheep, thus explains the discrepancy noticed by the *Springfield Republican* between

(1) The Messrs. Dawes of Lachine, Canadian born and bred, chain-harrow and roll their grass-land every spring. A. R. J. F.

(1) I regret to see that Mr. Saunders, of the Experiment-farm at Ottawa has decided that the beet-crop is not likely to pay in Canada, unless a bonus of four million dollars a year be granted to the growers and manufacturers. A. R. J. F.

(2) February. Now, March 25th, some good ones are to be seen. But why are the earliest almost invariably black lambs? A. R. J. F.

(3) Regularity of temperature is the great point. A. R. J. F.

the number of sheep kept per square mile in free trade England and the United States respectively: "Isn't there any body to tell the man who penned these phenomenally foolish lines that the English are a mutton-eating people, and that these sheep are bred for their *meat*, the wool being a by-product?" Dr. Hoskins is quite right in his exposition, and he is equally right when he says that "England, Scotland, and Wales have a vast area of mountains and downs where nothing else in the way of domestic animals can be profitably kept except sheep. 'The best market in the world for mutton, and lots of land good for nothing else,' is the open secret of the whole matter."

Well, it is so. Lots of mountains and sub-mountainous land fit for nothing else but sheep; still there is something more to be considered: even in the neighbourhood of London, on the Surrey downs, about Cudham, Addington, Keston, &c., there is land so poor by nature that it was almost unfarmable until the blessed gifts of providence, the turnips and sainfoin, made their appearance. Fire burned the rugged face of these hills; turnips grew and were fed off by sheep; oats, or sometimes barley, sown down with sainfoin, followed the turnips; and the sainfoin yielded good crops of hay, and the soundest of pasturage for weaning lambs, for from 6 to 10 years consecutively! But there were no sheep-killing dogs about; I never heard of but one loss of sheep on that account, and the traitorous brute, a Newfoundland, was shot the next day. As for not being able to put a stop to the ravages of these worse than wolves, I do not see why it should not be done in America as well as in Europe. Many a time have I seen what we call in England "self-hunting" dogs prowling about after rabbits and hares along the hedge-rows and plantations, but I never saw or heard of their interfering with sheep, and the reason is clear. The moment a puppy of any description whether he belongs to a gamekeeper or a farm-labourer, shows the least sign of being *interested* in a flock, he gets a good licking. Hounds are exercised, when young, in districts where sheep abound, and the thongs of the whippers-in have a marvellously deterrent power.

For my own part, I am so thoroughly convinced of the value of sheep to the Canadian as well as to the United-States' farmer, that, had I any influence, I would use it to the uttermost to put an end to the license with which sheep-killing dogs amuse themselves. Every dog not accompanied by his owner, or his owner's servant, should be at the mercy of the first man that sees him; and when sheep have been killed by dogs, and the owners of the murderers cannot be found, the county or parish should be compelled to pay the damage.

Green-manuring.—On page 60 of this number will be found the first part of a lecture on "the cheapest way to obtain Nitrogen and Phosphoric acid," with engravings explanatory of the text. What the plan may be worth practically I cannot say, but I think it will be interesting reading to most people. I shall reserve my observations on the matter until the whole is before the readers of the Journal.

Foot-and-mouth disease.—This scourge is, I regret to say, extending its march in Britain. Starting as it did in Smith-field Market, London, it has now been discovered in the Lothians, and goodness knows where it will stop. Mr. Chaplin and the Board of Agriculture are earnestly at work on measures to arrest its progress, and whenever it is found to be affecting a herd, the cattle composing the herd will be pitilessly slaughtered. (1)

(1) All importations of live stock from European countries are now barred. In fact, Canada alone has the right of free entrance for her cattle
A. R. J. F.

Incultivated land in England.—Some wiseacre has been stating that there are now 22,000,000 acres of land in Britain, that might be profitably cultivated, lying barren! This is of course, rubbish. Since the great fall in price of grain, some million acres or so of heavy land, that were broken up 'after the war,' have been laid down to grass, and there may be a few farms of poor clays that are seeking in vain for tenants; but, as a rule, land all over the island is in demand, in greater demand, in fact, than it has been for some years. Sheep are increasing; the excess of the number last year over the preceding year being three millions, and over the number in 1881 four millions! All other stock, horses, cattle, &c., are more numerous, except pigs, by the bye, which have slightly fallen off.

Nitrate of soda.—Dr. Hoskins, in the *Vermont Watchman*, speaks in high terms of this manure. I am glad to see this, for I have derived so much benefit from its use that it has really worried me to see it neglected, as it usually is in this country. On decently farmed land, taking the average of seasons, I am sure that 150 lbs. of nitrate of soda scattered on an acre of wheat, oats or barley, will pay. It should be sown in moist weather, and is all the more efficacious if applied at twice, an interval of ten days or so elapsing between the sowings. But the season must regulate this. If the first sowing, which must not be made before the blade is well developed, cannot be done by the 10th May, it would put off the second sowing of the nitrate too late, for by the 24th May, the weather is generally dry and hot. So, upon the whole, I fancy it would be wiser in this climate to sow the whole 150 lbs. at once. The quantity of nitrate of soda should, if the stuff is pure, contain about 23 lbs. of nitrogen. It should be finely powdered and sifted, to enable such a small quantity to spread equally over an acre of land. In England, where salt is very cheap, I used always to mix a couple of owt. of that material with 100 lbs. of nitrate of soda. This I did with a view to preventing too great a growth of straw: I cannot say whether it had that effect or not, but it might be tried here,—at all events, it could do no harm.

Dr. Hoskins' failure with potash for potatoes does not surprise me. I have used, experimentally, potash in various forms for all sorts of crops, and I never found it of the slightest use, except for clovers, &c. Of course I have heard of successful applications of it to potatoes, but I never met with any that would stand investigation. Where, as often happens in England, wood-ashes are largely used for turnips, I should be inclined to attribute their effects to the phosphoric acid they contain rather than to the potash.

"In another experiment we satisfied ourself that 150 pounds of nitrate of soda to the acre on wheat will also pay a good profit. We sowed it in strips across the field on wheat, oats and barley, and it very nearly doubled the crop in each case. An experiment with the German sulphate of potash on potatoes resulted queerly. We sowed a strip about twenty feet wide across the field. The tops grew about the same as the rest of the field as to size, but were two or three shades lighter in color—a real yellow-green tint. There was no perceptible gain in the crop. Other experiments make us doubt if potash is needed on our land—yet it is one of the longest cultivated farms in town. It has not been very highly farmed, but has, we believe, been run most of the time as a butter farm—very little else sold off but butter, and some stock.

We are more and more inclined to think that a large number of Vermont farms, on which the soil is lightish, need *nitrates* more than anything else to make them productive. The loss of nitrates in the urine wasted in our stables for so many years is telling upon much New England farm land,

far more than our farmers are aware. Ashes is most often tried, and generally it benefits the grass and corn; but when, as often, this fertiliser does not seem to benefit other crops, we think the most probable reason is that we do not have enough of nitrates to make up a complete fertiliser. Purchased nitrates are very expensive, and we ought to see, every one of us, that the nitrates in our manure all go back on the land. But this is not possible, except by saving all the urine of our stock."

Fertilisers—Has any one of our merchants imported Thomas 'slag'? I hear from England of its good effects on every description of soil, and its cheapness should knock every other form of insoluble phosphoric acid out of time. It is said to average 15% of phosphoric acid, which, if the slag be finely ground, would make it a most valuable addition to the turnip fertilisers, as thus:

300 lbs. basic slag;
200 " mineral superphosphate;
200 " Indian bone-meal;

ought to grow a first rate crop of swedes or turnips. The superphosphate would start the young plant into vigorous growth; the bone-meal would carry it on through the leafing stage; the basic slag would be ready to finish off the bulbing process, and a considerable proportion of the phosphoric acid of the bone-meal and slag would remain for the benefit of the grain- and grass- crops that finish the rotation. Indeed, if the first year's grass be dressed with farmyard dung, I cannot see but what this would be as cheap and as profitable a way of treating land as any we know of. The preparation for the root-crop would certainly be less costly, and the land would be more easily kept clean during the growth of the roots, for, heat up dung as much as you please, and there will always be more or fewer seeds of rubbish in it. Try it *M. J. C. Lan- selier*, please, on your farm, and let me hear of the results.

Butter.—The comparative consumption of butter in the principal European countries seems to be very unequal:

England, per head, per annum.....	13 lbs.
Germany.....	8 "
Holland.....	6 "
France.....	4 "
Italy.....	1 "

The small quantity consumed in Italy is easily accounted for by the enormous quantity of olive-oil the Italians use. (1) When we should give a child a piece of bread and butter, an Italian mother would toast the bread and spread it over with oil. And the same thing obtains in Spain, in which country butter is almost unknown to the working class.

Some butter I had up from Little Métis last September is still excellent in quality. I do not suppose Madame P. sends me her worst, but what she does send is always to be depended upon. Unlike the creamery butter we find in the grocers' shops here, the Métis butter will, what we used to call in my brewing days, "stand tap": that is, the last of a tub is as good as the first. And it was cheap: the 5 tubs cost me 19 cents a pound delivered into my cellar. I denote the maker (a French Canadian by the bye) by the initial letter of her name for fear any summer visitor to Métis might do me out of my butter next year, were I to indicate her more clearly.

Now, the two best lots of butter I have had sent me during the last seven years are the above and one I mentioned as having been made by Mrs. Gustaf Gylling, of Sorel. The soil of both Métis and Sorel is about as poor sand as can well

be found in any part of the province, though in each case amenable to judicious improvement. And yet, the butter, in the hands of a dairy-woman who knows her business, is as good as,—may be, better than—any butter to be found in Montreal shops.

Quality of milk—W. Fleischmann, manager of the Royal Domain at Kleinhof-Tapien, East Prussia, has been making investigations on the milk of the herd of Dutch cattle kept there. Among other conclusions he arrives at is one that confirms what I said in my address to the Dairyman's Association at their meeting at Montmagny: I am one of those who do not believe that the richness of milk cannot be improved by food. Mr. Fleischmann, like myself, finds that "the fact, long believed to be true in practice, that in general it is possible by increasing the amount of food nutrients to make the milk of cows richer in fat, *absolutely* as well as *relatively*, would seem to be fully confirmed."

Tomatoes.—Many a time have I tried to persuade the French-Canadian market-gardeners, or rather market-farmers, in the neighbourhood of Lachine, that if they want to get two or even four dollars a bushel for their tomatoes instead of thirty cents, the *single-stem* training is the only road to success. The reply I always met with was: We have ten or twelve thousand plants out, how on earth can we train and prune them?

Nobody expects such a thing to be done in a district such as Lachine. But if ten or twelve thousand are too many to treat in this way, the farmer might try two or three hundred.

In the continued experiments at Cornell University, on tomato-growing, it was found that, taking the ground occupied by the plants as one square foot, the *single-stems* gave 1.60 pounds of ripe fruit, and the others .75. In other words, the former gave more than double as much fruit as the latter. But the single-stem plants, as every one who has tried the plan knows, not only produce much more fruit but also much earlier fruit. Not only that, but, as all the fruit is off the ground, it is comparatively independent of the attacks of grubs. Not only that, but as tomatoes grown bush-fashion are usually planted 3 feet apart each way, there can be only between four and five thousand plants grown on an acre; whereas, single-stems do perfectly well at 2 feet by 18 inches, which gives nearly fifteen thousand plants to the acre!

ARTHUR R. JENNER FUST.

Boullie Bordelaise.—As the time for dressing potatoes with the Bordeaux mixture of copper and lime is not very far off, it is as well that our readers be as well informed as possible on the subject of its previous success or failure. Some who have tried it are loud in its praises; others, and among them Dr. Aitken, chemist to the Highland Agricultural Society of Scotland, a man of practical as well as theoretical attainments, will have nothing to do with it. This is what he said as lately as February 2nd:

POTATO DISEASE.

Dr. Aitken also reported that, at the request of the Board of Agriculture, a very careful set of experiments had been carried out in the counties of Berwick, Renfrew, and Forfar, with the view of ascertaining the effect of sulphate of copper mixture in the prevention of potato disease. The main result had been to show that the spraying of potatoes in the manner directed had not produced any effect whatever in diminishing the amount of disease in the crops treated.

The following is a more extended report of the above experiments:

With the object of testing the merits of *bouillie bordelaise*

(1) Even well-nurtured Italians like their oil a little rancid.

as a remedy for potato disease, the Highland and Agricultural Society instituted experiments last season upon farms situated respectively in Haddingtonshire, Forfarshire, and Renfrowshire. The mixtures were tested: the one consisting of 25 lb. of sulphate of copper, 10 lb. of burnt lime, and 80 gallons of water; and the other of 15 lb. of sulphate of copper, 5 lb. of burnt lime, and again 80 gallons of water. These quantities were applied per acre, and also in half doses per acre. Repeated observations were made during the growing season, but in no case was any distinction visible among the plots. The drills that were sprayed, as well as the unsprayed drills between them, grew quite uniformly; and when disease appeared on the leaves it seemed to be fairly distributed over the whole area. The report states that the general and quite evident conclusion to be drawn from these experiments is that the Bordeaux spray has entirely failed to have any restraining effect whatever on the progress of the potato disease. The opinion is further expressed that, if the spray is a protective against the potato disease, it can only be so when the disease attacks the plants while they are still young, and their entire surface is capable of being reached by successive sprayings. At the same time it is considered possible that such complete drenching of the young plant with the *bouillie bordelaise* might seriously impair its vitality, and thus prove worse even than the disease itself. The general result of these experiments is such as to afford growers little, if any, confidence in the efficacy of this mode of treatment. On the whole it may be said that the results of the Scottish trials are decidedly confirmatory of the negative issue of the extensive series of field experiments upon potatoes conducted by Messrs. Sutton and Sons at their trial grounds near Reading." (The R. A. S. of E. say the same)

LONDON MORNING POST.

Pease meal for butter.—Dr. Hoskins publishes the following in the *Vermont Watchman*. In my opinion—*valeat quantum*—Governor Hoard is quite right. In England pease or beans, or both mixed, are of every day use for milch cows, fattening bullocks, pigs, and sheep. Calves, too, are allowed a small quantity of pea-soup, occasionally, but crushed linseed—not ground cake, but the seed itself—is always given with it, for fear of the pease being too constipating.

"The *Homestead* says "pea meal is the stuff for butter," and Governor Hoard calls it the foundation food for butter and milk, and for muscle in cows, pigs and calves. The *Homestead* tells its readers that peas should be planted thickly (two and one half to three and one-half bushels per acre) and at least four inches deep—which means plowing them in, for we know of no planter (unless it may be that some potato-planter will do it) which puts down any seed an honest four inches. Our contemporary adds that a pound of pea meal is worth six pounds of ordinary bran as a feed ration. A good crop of pease will average forty bushels to the acre and give you 2,600 pounds of pea meal, the equivalent of 15,600 pounds of bran."

The usual practice here among the French-Canadian farmers is to damp the pease intended for seed, and then sprinkle them with plaster. They sow far too little seed, the consequence of which is that each individual plant, having an almost unlimited space for its development, spreads and grows too luxuriantly, so that it keeps on prolonging its stem instead of devoting itself to the production of pods. I have seen some bine, or *haulm* as we English call it, ten feet long.

A good *drill* will bury the seed deep enough—3 inches will do very well—, if the land is *thoroughly harrowed* beforehand. The proper quantity of seed depends upon the size of the pea sown. I should not put in less than 2½ imperial bushels or more than 3 bushels to the acre: one-sixth less

to the *arpent*. If pease are *drilled* in rows 2½ feet apart and horse-hoed (aye even hand hoed too), they will not only pay for the cultivation, but the following crops of the rotation will benefit immensely. I never but once saw pease broadcasted in England, and that was on a farm in Shropshire. The tenant was leaving his occupation, so he did not mind how foul he left the land.

The last horse-hoeing should be given just before the pease "shake-hands" across the rows, and if immediately after the work is done, a pound or so of rape to the acre be sown between the rows, and covered with a rake, a nice bite for sheep will be ready a month or six weeks afterwards.

Pea-straw is good for all kinds of stock, but, as we saw last month, not so good as bean-straw.

As pease and beans have a tendency to make meat firm, distillery-fed cattle would be the better for some in addition to the "slop." Lamb, which in its babyhood is always soft stuff, is greatly improved by a daily dose of white pease. The young pig, on the contrary, if intended to be killed at or about 12 to 15 pounds the quarter, should never taste pease, and the bacon-hog would be all the better if fattened on corn- or barley-meal, and finished only for about 3 weeks on pease. Almost all the large pork here is hard: profitable enough, but not pleasant to the palate.

As far as the crop of pease goes, I never saw 40 bushels an acre either here or at home. The average Canadian, or rather Quebec crop, is about 12 or 15 bushels. Ontario, no doubt far exceeds this. England rarely grows more than 25 to 30 bushels, but then *field-pease*, in that country, are generally treated as a *corpus vile*, and seldom sown by good farmers, as they have a terrible tendency to make land foul, in spite of hand- and horse-hoeing, and are very uncertain croppers at best. In fact, I may safely say that in no part of England do *field-pease* constitute a limb of the regular rotation. (1) Perhaps, one other reason for the dislike to growing pease is that not one bushel in the hundred of English-grown pease will boil, and even if they would melt into soup, the poorer classes, for some queer reason or other, will not eat pease-soup, though on the tables of the upper classes it makes a regular feature of the winter bill of fare; and, when made with plenty of celery, and flavoured in the soup-plates with dried mint, a capital thing it is—for luncheon, it is too heavy to begin dinner with.

I said enough about pease for milch-cows in the March number of the *Journal*. The beans I mentioned just now are, of course, the horse-beans. I have seen the straw of them seven feet high, in the alluvial soils along the Vale of the Severn, in Gloucestershire, and yielding 80 bushels, of 65 lbs. each, to the acre, besides the valuable haulm for the strawyard cattle and colts.

Both beans and pease—everything else too—should be got into the ground as soon as possible after the snow goes. Beans can be "muddled" in before the land is fit to sow with anything else. What is our old proverb? "Sow beans in a flood, and they'll come up like a wood."

Grapes.—I fancy the craze for vine-growing has, as I predicted it would ten years ago, died out in this country. Even in Ohio the grape, at 2 cents a pound, cannot be a paying crop, as Mr. Cushman probably feels certain about. Whether the wine made from the Catawba grape can bear competition with the foreign wines of France, Germany, &c., I cannot say, as I never tasted it. By the bye, the *Witness* tells us we certainly must not grow hops, or barley for malting, and I suppose rye is tabooed, and certainly grapes for wine-making!

When land is *clover-sick* pease occasionally take the place of that crop.

A. R. J. F.

E. H. Cushman of Euclid stated that that station had shipped 7,200,000 pounds of grapes last year, and this year 9,270,000 pounds; that there were 1,500 acres of new grapes coming into bearing this coming season, and 1,000 the next. The owners were disappointed in prices, at two cents a pound. They planted 680 vines to the acre. The Concord sells best. The question was presented, "Is wine a proper horticultural exhibit?" The answer generally was promptly in the negative. Mr. Van Deman said "if it was an agricultural exhibit, whiskey, on the same rule, would be a proper exhibit there." The Catawba had been yearly growing less in favor with marketers, all however, admitting its fine quality. The Worden has a short season, and is commonly out of the market before the Concord comes in. There is a tendency among grape-growers towards overbearing.

Cows with sheep.—I should not pasture sheep and cows together unless for convenience sake, not because, as Dr. Smead seems to hint, the sheep "dirty the grass so that the cows will not eat it;" but because, while cows should always have a good long bite of grass to lap their tongues round, sheep will do well, with the nibbling action of their mode of feeding, on closer pasture. As for water for sheep in the "out-door time," that is, as long as they are on grass, vetches, rape, &c., sheep require no water at all. It may surprise Dr. Smead to hear that except on the Downs, where the soil and climate are very dry, sheep in England never drink from one year's end to the other, and of course when on turnips in winter they swallow more liquid a great deal than is good for them.

We cannot always draw out dung at once here; even if we could, we could not spread it at once; even if we could get over these two difficulties, we have not always land ready for its reception; and, moreover, dung should always be turned over and heated to kill the seeds of weeds.

"Would you advise the pasturing of sheep with cows?"

Dr. Smead.—I would not advise allowing sheep to run with the cows, as they dirty the grass so that the cows will not eat it. Sheep should run in separate fields. They will always do best when partitioned off, and changed from one to the other every week. Plenty of water should be furnished them, so that they can have access to it all times, as they drink often, while the cows will be satisfied with access to it twice or three times per day. Care should be taken to enforce this rule in winter when the sheep are kept housed. From five to six years is about long enough to keep breeding ewes, as they should be turned off for mutton while their teeth are yet good. (*All right.* A. R. J. F.)

"When is the best time to draw out manure after it is made, and how should it be applied?"

Mr. Powell.—There is but one answer to the question with me. Draw it out at once. More loss comes from not doing this than almost anything else on the farm. Get it out as fast you can and apply it directly to the soil.

Country Gentleman.

Yield of wheat in U. S.—I believe the United States census reports the average yield per acre for a decade at about 11 bushels; last year the yield was about 15 bushels. I suppose no reasonable man expects that this phenomenal yield will be soon repeated; indeed it would be quite safe to expect a yield for the current year below the average.

Country Gentleman.

Sandy loams.—It is astonishing how opinions vary as to the desirable qualities of farming land. I prefer sandy loams in good situations to any other description of soil. A correspondent of the *Montreal Witness* says, and quite correctly,

speaking of the land about Malono, in the State of New-York:

"The Salmon river gives excellent drainage, as well as limited motive power, which is pretty well utilized. Though in the midst of an agricultural district of well-to-do farmers, yet it is what Canadians, at least, do not call a fertile section, the land being a sandy loam, and has for the past twenty years been a favorite district for hop growing."

The French-Canadians seem to prefer the stiffest clays, and the only reason I have ever been able to discover for this preference is, that such soils manage to produce some sort of a crop however poorly manured they may be. Malono could not have grown hops for so many years had it not been a naturally fertile soil. A sandy loam will grow anything you like to ask it, if you ask it properly, and is always the parent of early crops.

Agricultural visitors.—I hear that during the last season, M. Marsan, the professor of agriculture at l'Assomption, took eleven of his pupils to visit the leading farms on the Island of Montreal. A wiser plan to open the minds of these lads could not have been thought of, and I beg heartily to congratulate M. Marsan on the sensible movement he has initiated. Farmers, as a rule, stay at home far too much. An immense deal of good was done in England by the institution of the annual meeting of the Royal Agricultural Society in the summer. Before these conventions were held, very few farmers saw anything of the farming of any district but their own. They went perhaps, to London, to see the exhibition of the Smithfield Club, but that was always held in winter, so the visitors saw nothing but root-crops on their road. Now, four farmers out of five attend the R. A. S. show when it is held in their district—in July—and many of them travel hundreds of miles to these exhibitions: they see the crops at their full growth; they talk over matters with each other; they carry home with them new ideas; and they shake off the prejudices of their fathers; no longer believing that the farm-practice of *Mudpool-cum-Stonyfield* is the best in the world and absolutely unimprovable.

Bravo, Mr. Marsan! Go on in your wise route, and, next year, try to improve upon it by taking your lads to see the farms of our dozen or so good men while the seed is being got into the ground as well as when the crops are maturing.

Potatoes.—Professor Voelcker's experiments are always worth study. His trials of four different manurings for potatoes at Woburn, in 1891, show that the largest crop was furnished by a dose of artificials composed of

Superphosphato..... 300 lbs.
Kainit (potash)..... 300 "
Sulphate of ammonia..... 200 "

The dung from steers fed on decorticated cotton-cake in addition to an ordinary diet of roots, hay, linseed-cake, and barley, gave the best yield of the dunged potatoes; next came those manured with farmyard dung "of indefinite nature;" and, last of all, the potatoes manured with dung from steers eating undecorticated cotton-cake:

Yield of potatoes per acre.

Plot	Manure per acre.	Yield per acre.	
		Pounds.	Bushels.
1	12 tons dung (decort. cotton cake) ...	17,345	290
2	12 tons dung (undecort. cotton cake) ...	14,687	244
3	12 tons farmyard manure.....	15,658	260
4	800 pounds mixed fertilizer....	18,987	316

But according to the "new lights"—see p. 60 of this number—the 200 lbs. of sulphate of ammonia might have been omitted.

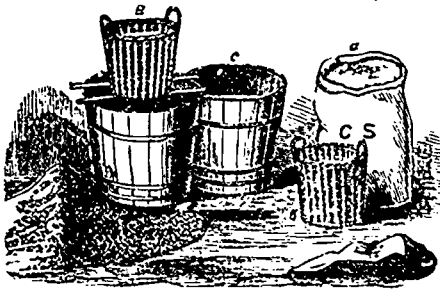
The barley experiments of the two last years at the same place, Woburn, showed as usual, that mineral manures without nitrogen are useless.

Bulletins of the U. S. Department of Agriculture.

Treatment of Smuts of Oats and Wheat.—I have never seen smut injure oats to any extent. Wheat, on the other hand, suffers continually from *black-heads* in every part of the world—as least, as far as I know. A curious superstition used to be believed in in my part of England: that a few ears of smutted oats in a field of that grain was a sure sign of a good crop! Of course, it was nonsense.

The bulletin (No. 5) recommends the treatment of seed oats and wheat by the "Jensen or hot-water plan," which consists in scalding the grain with water at $132\frac{1}{2}^{\circ}$ F. Water at this temperature will not injure the germinating power of the seed if the immersion is not continued more than fifteen minutes. The water must be renewed from time to time, for which process a long description is given in the pamphlet.

A far simpler plan for the destruction of the smut is one I have practised for many years and never found to fail.



Make a small heap of the seed-grain—I generally used about 8 bushels at once—; on it place a large pail—3 gallons—of boiling water, into which drop two or three good sized lumps of fresh-burnt lime. The ebullition will be pretty violent, some of the water will flow over on to the grain, and, when the pail is emptied of all the liquid, each grain will be found covered with a coat of lime. Two or three turns over complete the job. The only inconvenience in this mode of treatment is that, as in spreading lime on the land, the *stoury* particles will trouble the sower, but a veil will protect his eyes from damage.

A solution of *blue-vitriol*, into which the seed grain, in a basket, is dipped, and allowed to drain off into a tub, as lye is often made, answers well: see *cut*. I have heard of *sulphate* of soda being used effectually, and stale chamber-lye, but I have no experience in these steps. The grain should, of course, be sown at once.

Tobacco.—The treatment of the tobacco plant, from seeding to packing, forms the subject of the Farmer's Bulletin No. 6. The difference of the climates of the States and of our province is so great that the advice to tobacco-growers contained in the bulletin must be sifted cautiously, particularly as regards the dates advised for the different operations.

We cannot hope to succeed in escaping from frozen leaves without the aid of a hotbed: the farmers in the States sow on the ordinary land. The bulletin recommends setting out the plants on the 1st of May: the 10th of June is early enough here.

Still, as I have often said in this publication, a crop of tobacco well grown and well dried, pays as well as any crop on the farm, and every one who has a fair space of light land to spare, *within easy reach of the dung-cart*, would do well to plant an acre or so. Tobacco is a "cash-article," and there are so few things the farmer here has to sell that he can get ready money for.

Several notes in the bulletin are worthy of attention; for instance:

How to sprout the seed.—Upon several layers of woollen cloth spread the seed about one-quarter of an inch thick. Cover up with a woollen cloth, dip the whole, soakingly, in warm water, set it in a warm place, and keep it damp. In three or four days, small white spots will indicate germination. Dry the seed with ashes and sow.

I used to cover my hotbeds with frames on which was tacked stout calico dressed with linseed oil. The first of April is early enough to sow here, and when the plants are large enough to handle, i. e., about the 10th May, they should be transferred to a cold-frame to *make roots*. The *cut-worm* will not do much damage to well rooted plants.

Manure heavily with dung, and add 400 lbs. of kainit, or potash in some form, and 300 lbs. of superphosphate to the acre. To use artificials alone will be risky; in a damp season they may answer, but in a dry one they will probably fail utterly, as happened to the crop of a friend of mine, a manufacturer of tobacco, on his farm at Pointe-Claire.

Thirty inches between the rows of plants is sufficient and 24 inches from plant to plant in the rows, even for the "Connecticut seedleaf" kind; though the bulletin recommends 40 inches each way.

In planting, jam the ground down round the plant *as tight as possible*, and if the plants are well soaked with water about half an hour before drawing them from the bed, they will not fall back however hot the sun may be. Still, a dampish afternoon is the best time to do this work. Never transplant anything when the ground is *wet*. Keep horse- and hand-hoe going all the season until the leaves are too high.

Pruning and topping.—I do not think many farmers here prune their tobacco, which operation the bulletin defines to be "the stripping of the lower leaves, leaving the stem bare for 6 or 8 inches above the ground." This would seem to many to be an act of wastefulness, but it is not, as the lowest leaves, if left on the stem, are generally poor, dirty from the splashes of mud they catch, and often fall off of their own accord. Of course, the upper leaves benefit by the destruction of the lower ones.

Topping, or cutting off the flower-buds, should be done as soon as any show. Eight leaves are enough to leave on the large kinds; as for that delicious little Canadian weed, for which I would willingly give, if well grown, and cured without heating when green, two dollars a pound, ten or twelve leaves may be left. This kind may be set very close: 24 in. x 12 in. is far enough. I gave my last seed to the Curé at Compton, and have never been able to get any since. Of late years, all the Canadian tobacco I have tasted has been muddled up with molasses and spirits, so that it has the flavour of inferior United-States stuff.

Tobacco set out in the middle of June should be fit to cut about the 1st September. A slight frost will not hurt ripe tobacco, but it plays the mischief with green leaves. The bulletin says, "six weeks after topping, tobacco should be fit to cut." Here, I should say that a month after topping tobacco *must* be cut, ripe or not.

Cut the plant *down from the top* with a thin butcher-knife, to the lowest leaf, set the plants astride a stick and hang as soon as the leaves are wilted.

The processes of drying by fire-heated barns are not likely

to be practised here. All we want is a barn as nearly airtight as possible and roomy enough, as people going about in a place crowded with plants are likely to break off the leaves, which in certain stages of the process of drying are very brittle.

Strip in moist weather; make at least three kinds or qualities; leave the sweating to the manufacturer, who understands how to do it.

Never leave the freshly cut tobacco plants in a heap, but hang at once. If the green plants heat in the slightest degree, the blisters on the smoker's tongue will call for vengeance on the grower.

At Jolietto, where I first grew tobacco, the people used to let the plants heat on purpose. They had heard of "sweating" as part of the manufacture, and they concluded that it did not signify at what stage it was done.

The cut-worm can generally be prevented from doing much damage by the means I indicated above. The horn-worm, I was never troubled with, but according to the bulletin, it generally puts in an early appearance, and it must be hunted diligently throughout the season and destroyed, or it will greatly injure or ruin the crop. The first week of its existence is occupied in eating several small holes in the leaf near the spot where the egg was deposited by the parent moth, generally upon a lower leaf. These small holes indicate its hiding place during the first week of its life and will aid in its discovery.

Good light loam, with 15 tons of well rotted dung, 400 lbs. of kainit, or 25 bushels of hardwood ashes, and 300 lbs of mineral superphosphate, (13 to 14 % of phosphoric acid) will do well.

A full description of my own way of growing tobacco will be found at page 177 of the Journal for 1887, and page 161, 1881.

I calculate the profits on an acre of tobacco, thoroughly well seen to, as follows:

Manure.....	\$15.00
Labour	45.00
Rent of land, &c.....	4.00
Freight	5.00
<hr/>	
Deduct for dung and labour to	\$69 00
subsequent crop of grain.....	17.00
<hr/>	
	\$52.00

1700 lbs. of tobacco at, say, 10 cents = \$170.00, balance to profit \$118—and the land clean. What other crop grown on the farm will leave one-tenth of such a sum as profit?

A. R. J. F.

The Canadian Horse and his origin.

(Translated from the French of J. A. Couture, V. S., by C. F. Bouthalher.)

What is the origin of the Canadian pony? or rather of what breed were the first horses sent to Canada by the King of France?

There are three ways of treating the question of the origin of the Canadian horse, or any other race of animals.

1. From the historian's point of view.
2. From the hippologist's, or horseman's.
3. From the naturalist's.

When the writer of history can refer to authentic historical documents he is tolerably well able to pronounce upon the origin of this or that other breed introduced into a country; but when these documents are wanting, he generally has recourse to hypothesis, and then his opinion is worth nothing.

The hippologist, relying upon his greater or less knowledge of horses, sets to work by a series of comparative-study examinations which are very superficial; his inclinations and interests, and his more or less lively imagination, lead him to conclusions, which are, oftener than not, quite erroneous.

The naturalist only, by relying on the science of comparative anatomy, and of zoology, can always determine the true origin of races.

The origin of the Canadian horse has been treated from an historical point of view, by an educated writer, who has published the result of his investigations, lately, in the Montreal Journals, and by hippologists, at about the same time.

HISTORY OF THE CANADIAN HORSE.

It is quite impossible to determine the origin of our horses by referring to historical documents. All that we know about them is, that they came from France. All that the historical writer above alluded to can establish as a matter of fact is, that the first horses sent to Canada, were shipped at the port of Havre, on the 16th of July, 1885. This fact was already known—the only new matters of information, on the subject, being the details concerning the distribution of these horses among the different persons mentioned by the writer, and the conditions upon which they were given or consigned to their care. But when it is asserted that the Canadian horse is descended from the Percheron breed, the assertions should be qualified by the word *probably*, as nobody has ever been able to produce documents in proof of this statement.

We might just as well say that the horses sent to us in 1685, were Breton horses, (of either the large or small breed) or Normans, or Arabs.

Why not Arabs? There are no historical proofs to show that the Canadian horse is *not* descended from the Arab, as there are none to show that he *is* descended from the Percheron. If these proofs of the origin of the Canadian horse do not exist, the equine historian is thus obliged to have recourse to hypothesis, and, then, *any* conclusion is possible, if his imagination is *only* lively enough.

Thus, the assertion that the Canadian horse descends from the Percheron, is merely an hypothesis. What has been said about a Percheron imported in Quebec, in 1816, of his influence on the equine race, of the County of Washington, and of his relationship to the *Gray Messengers*, is another hypothesis.

What has been written about the influence of the Percheron on the horses of Maine and Vermont is another hypothesis. As long as the historian cannot bring historical proofs to his aid, his opinion, as to the origin of the Canadian horse ought not to be accepted.

From the hippologist's point of view, a great admirer of the Percheron breed has also treated the question: he naturally concludes that our horse is of Percheron origin.

I maintain most distinctly that the Percheron is a very handsome, and an exceedingly good animal, one of the finest and best horses in the world. He is strong, full of courage, enduring, very active for his weight, gentle, highspirited, easily kept, intelligent, &c., &c. I like him better than any of the other large breeds, without exception, and where large horses are useful, wherever, even, they can be kept at all, I should like to see the Percheron. I hope that after having made this assertion I shall not be accused of being prejudiced against this breed of horses, or of being disposed to run it down in the interests of another breed. Having thus eased my conscience on this subject, I may be allowed to continue. On what then does the hippologist rely, for his assertion that the Canadian horse is descended from the Percheron, or in other words, that the horses landed at Quebec,

in 1685, were of the Percheron breed? Is it the great resemblance which exists between the two breeds? Certainly not. A mere glance is sufficient to convince one of the contrary. The head of the Percheron is large, long, and straight or slightly roman-nosed, that of the Canadian horse (I speak of the Canadian horse proper, not of what is now left to us of him) is small, short and square; the hip of the Percheron is ragged, that of the Canadian horse is round; the croup of the Percheron is straight or slightly inclined, the Canadian horse's is drooping, and this is a typical point in him; the withers of the Percheron are thick but high, those of the Canadian are also thick, but low, one of his greatest defects; the legs of the Percheron are smooth, the Canadian horse's legs are thickly covered with long hairs; the jaw of the Percheron is not wider in proportion than any other part of his head, while that of the Canadian horse is disproportionately wide and deep. Another typical characteristic of our horse: the Percheron is rather long in the loin, the Canadian very short. These characteristic points are those of the Percheron of years ago, and such as I find them enumerated in du Hays, page 17. Therefore, the Canadian horse is not a degenerate Percheron, as has been asserted. And, before this belief becomes an article of faith among us, it is better, while there is still time, to dispose of it at once, and for ever: in 10 years, in 5 years, it might be too late. Let us see what trouble the French naturalists have had to dispel the belief, that the Percheron is of Arabian origin, an origin invented by interested hippologists.

Mr. du Hays, among others, an ardent admirer of these horses, (du Hays, *Le cheval Percheron*, chap. IV, p. 27,) says: "The Percheron comes from the Arab"; and all the other interested horse-breeders, repeat after him: "The Percheron comes from the Arab"; and the public takes it for granted, that this is an indisputable fact.

No, the Percheron does not descend from the Arab, and what is more, there is nothing about him to make us believe that he traces to that breed. Read what Samson, the highest authority on anthropology, says on this subject:

"It is high time to get rid of this notion, accepted by hippologists, so-called horse-men, and repeated, without authority, by the author of the article on the subject, that horses brought back from the Orient, by the crusaders, have contributed to the formation of our equine races. First of, all no historical document has ever been brought to light, by anybody, in support of this assertion, and, long ago, Youatt established, in "The Horse," the utter unlikelihood of such a supposition. It is a bit of pure fantasy, evolved from the fertile imaginations of these hippologists. They said to themselves: The knights of the Crusades could not have helped being struck by the beauty of the horses of the East; they must have brought back some of them on their return to the West. That was quite sufficient. If the Oriental stallions of the times of the crusades had ever exercised the influence attributed to them upon our equine races, we should discover their type among them still. For instance, this Oriental origin has often been claimed for the Percheron breed. It is certainly not necessary to be a very astute craniologist in order to see that there is nothing in common between the form of the *cranium* of the Percheron, and that of the horse called the Arab. The sole quality in common between the two breeds is that of being, both, good, handsome horses, and endowed, both of them, with courage and energy. Besides this, do we not know that the natural type to which the Percheron belongs already existed in the Paris basin of the Seine, since the quaternary geological period? (1) It is an error to suppose that a few foreign stal-

lions could thus transform a whole equine race. Experience teaches us, that if their use is not constantly persevered in, the influence which they at first exercised soon dies out. The predominating atavism of the mother race i. e., of the local type, infallibly eliminates the foreign type. It is a maxim in anthropology that the foreign elements, if few in number, become merged in the native one.

"Dogmatical hippologists ought to learn these things, and if they knew something more about them, they would certainly not entertain the belief that a few Arab stallions, supposed to have been introduced at the time of the crusades, were sufficient to exercise a permanent effect upon our equine races of the West. (Séance of 25 June, 1891, of the Société Centrale de Médecine Vétérinaire de Paris.)"

Thus, history does not tell us that the Canadian horse is descended from the Percheron breed, and if we can learn anything from hippology it is that he does not do so.

If one could trace back the origin of the Canadian horse by a simple comparative examination with another breed, it ought certainly to be attributed to the Breton breed.

Look carefully over "Roi de Bignon," a Breton horse imported by the Haras National, and you will be struck by his likeness to our little horses.

This likeness comes out still stronger when the comparison is made between them and a Percheron.

I have before me now, the picture of a Breton horse, of about 30 years ago, and another of a Percheron of about the same date. The portrait of the Breton looks very like the Canadian horse, that of the Percheron not at all.

See the description which Magné, ex-professor of Zootechnology gives of the Breton horse: "Body thick in proportion to height, rather long, and round; ribs round, chest ample. Withers thick, but often low. The neck is thick and slightly arched, head wide over the forehead, narrowing towards the summit and beneath the eyes, the subnasal bones stand out, and cause the anterior surface of the head to project in a corresponding way over its lower portion; the croup is also typically characteristic, it is short, drooping, with a depression in the centre, the hip is smooth and rounded.

The Breton diligence horses have generally hairy legs. The grey coat of youth, becomes white with age. There are flea-bitten gray horses, in Les Côtes du Nord and Finistère, with cleaner legs, which some competent judges consider the type of the breed.

Speaking of Hackneys, of the smaller and larger breeds, (Bidefs bretons, et doubles bidefs) (1). Magné says: "These small horses look like the Breton diligence horses: same formation of head, and croup, but they are generally bay or chestnut, with light coloured manes and tails.

I may here remark, in passing, that these small Breton horses are descended from the Arab horse. "(Aryan type, with flat forehead)." (Samson loc. cit.)

Those of my readers who are well acquainted with our little Canadian horse will be struck by the numerous points of resemblance between him and the Breton horse, more especially the smaller variety of the Breton breed, as described by Magné.

Should we wish to continue to search for the origin of our horse in a similar manner, we may as reasonably attribute his descent to the Norman horse. Look at Holopherne's head, a Norman horse in the Stables of the Haras National, and tell me if it doesn't look a great deal more like the head of a Canadian horse than that of a Percheron? Without being a naturalist, my knowledge of zootechnology and comparative anatomy is sufficient to enable me to deny most emphatically, that the Canadian horse is of Percheron origin.

(1) The quaternary, or post tertiary, period embraces the recent alluvium, peat, the cave deposits, and the glacial drifts. A. R. J. F.

(1) Bidef is rather nag than hackney.

I am not yet prepared to say that he derives from a Breton stook—I must study the craniology of the two horses more minutely that I have had an opportunity of doing up to the present time,—but I should not be at all surprised to find that such is the case.

(From the French.) (Signed) J. A. COUTURE.

Clover for cows.—No better food for cows than clover-hay, except when there are old meadows; for the mixed grasses of a dozen different kinds naturally impart a higher flavour to the butter than one solitary kind.

Dairying and Beef production.—Strangely enough, after sending my essay, in French, on Milk and Beef to M. J. de L. Taché to be read at the Montagny meeting of the Dairymen's Association,—a translation of which will be found in the last number of the Journal—I happened to be turning over an old Bulletin of the Wisconsin Farmer's Institutes, in which I found an article, by Mr. C. R. Beach, of White-water, Wis., on the same subject entitled: Dairying and Beef Production. He, like me, objects to throwing aside his cows that are not perhaps quite up to the mark, as things of no value, and instances, among others, three that were sold in the early part of 1889 for \$25; two for \$8 apiece and the other for \$9. Were his article not so long, I should like to quote it *in extenso* but the gist of it may be gathered from the following:

In July I bought 20 cows, at a cost of \$31.70 per head, and milked them, sending to a factory that closed the first of December. As the cows were giving a large flow of milk, I thought I would make a little butter before drying them. I made a couple of jars, and sent it to a hotel in Chicago, for which I received 31c. per pound, with an offer that if I would furnish them a hundred pounds a week for a year they would pay me 32c. per pound. In the place of drying my cows, as I intended, I arranged my cellar for keeping milk, and milked those cows all winter and spring, then selling them for beef at an average of about \$40 per head.

FIGURES THAT SHOW A PROFIT.—Let us look at this matter a little more in detail. The cow that comes in milk in the spring and is milked to the 1st of December, weighing 200 to 1,000 pounds, would not, the last two or three years, have brought over 2c. per pound for shipping, and often less. If, now, a lot of such cows be fed daily from that time until the 10th day of May, 40 pounds of field-corn ensilage, worth 5c., with 10 pounds of wheat bran, worth 6c., and 10 pounds of good hay, worth 3c., making a daily ration worth 14c. (there are other rations equally as good, but I have mentioned this because I used it last winter and this, and know that it is both cheap and good), they will give from 12 to 20 pounds of milk per day, averaging 16 pounds, which will be worth from \$1 to \$1.50 per hundred, averaging \$1.25, making the 1c. pounds of milk worth 20c. daily or 7c. above the cost of the rations. The manure will pay for the work, and you have for the 160 days' feeding \$11.20 above cost. If, now, these cows be dried, turned to pasture, and fed five pounds of corn meal until the 20th June—40 days—at a cost of \$1.80 for pasture and \$1.20 for grain, the expense will be \$3. Deduct this from the \$11.20 profit on milk, and you will have \$8.30 as the average amount they will have payed, above their *keeping*, out of their milk. At this particular time of the year the winter-fed cattle will be out of the market, grass beef not yet ready, and your cows will therefore sell well and bring at home 3c. to 4c. per pound, live weight, averaging 1½c., they will have each added a hundred pounds or more to their original weight (I have in several instances had a whole car-load of cows add 80 pounds each by running 40 days on pasture), without grain, and will therefore bring \$35

to \$38 per head, or \$17 or \$18 above what they would have sold for the 1st of December, which add to the \$8.20 profit on milk, and you have a net gain of \$25 to \$26 per cow.

You may think these figures fanciful and extravagant, but they are not, and it will not take your best cows to do it, either. We, in Wisconsin, dispose of not less than 100,000 cows annually, most of them going for canners, at less than 2c. per pound. Had these cows been handled as I have indicated, with the results as I have figured, there would be an annual gain of \$2,600,000 to the wealth of the State.

Do not think I am trying to persuade you to slaughter your cows, in order to get money. I am only trying to show how more money could be made out of those we do dispose of. Some of our teachers are continually teaching that one-half the cows in Wisconsin do not pay their keep, and they advise us to sell them and supply their place with better ones; but they do not tell us how it would be almost wicked to sell them for dairy cows to those who do not know as much as we.

EXPERIENCE IN ENGLAND.—In confirmation of what I have said, some twenty five years ago, Mr. Hosford of England (as reported by Stewart in his work on feeding) made a specialty of purchasing cows under six years old, feeding them for beef and milking them at the same time. In this way he could, in 6 or 8 months, increase their selling value for meat something like 50 per cent, and at the same time realize a handsome profit above cost of feed out of their milk. He fed six cows 191 days at a cost of 27c. a day each, amounting to \$311. They averaged 35½ pounds of milk per day, which brought \$1.44 per hundred pounds, amounting to \$592 leaving a profit of \$281, or \$46.83 per cow on the milk alone, besides their increased value for beef. They had added to their live weight 84 pounds each.

In the discussion that followed, Mr. Beach met with very little contradiction, one man objecting to the selling price of the out-going cow, and another to "the impossibility of fattening old, full blooded Jersey cows, and, on the other hand, Captain Enos declaring that "whenever a heifer or cow was ready to turn off, I did not ask the question, how much could I realize from that creature? I figured up that if she had been in milk six or seven years, she had earned me from 25 to 30 % net profit every day, and I came to the conclusion that she must go to the butcher at once." To this, Mr. Beach replied: "that is precisely what I propose. get them ready for the butcher and sell them to him. We agree." And I agree with Mr. Beach, as do all English dairymen.

Finding the above article in Bulletin No. 3, 1889, I thought I would look farther, and I found several very interesting passages in the discussions in Bulletin No. 5, 1891. For instance:

Mr. McKerrow believes that "if plaster were sown every year upon those soils, the land might become clover-sick."

Supt Morrison, showed that the theoretical "value of the excrements of a cow in full milk fed on full rations of hay, silage, beets, malt-sprouts, cottonseed-meal, and bran, was ten cents a day." Of horses, fed as usual, the manure was worth, on working days, only 4 cents, but on Sundays, when they passed the whole day in the stable, seven cents. The excrements of sheep, he valued at one and a-half cent a day, but found them very deficient in potash." Can that be owing to the wool-growth?

Mr. Thos. Convey "did not think land can be injured by ploughing when dry, but that it receives permanent injury by being ploughed when wet." We used to say, in England, on our heavy clay, that a skittle-ground (bowling-alley) should be kept up on every farm for the ploughmen to amuse themselves in during wet weather, when the horses were in the stable and there was no work to do on the farm.

Mr. Convey, in ploughing sod, "prefers turning it over flat to turning it over edge-wise." I don't. the harrows don't catch hold of it. All furrows, in ordinary ploughing, should be laid at an angle of 45°.

Mr. Everett says, very wisely, "the foliage of the clover plant is the most valuable part, and we must save that if we wish to get all the feeding value in the hay." To which I add: mow early; mow very early; very early indeed. Turn the win-rows over, cock, and let it cure in the cock. As for moving the half-made hay, or shaking out the cocks, that is the safest way to lose the leaf. On my side of England, i. e., S. E., we never used hay caps, and our hay, as it supplied the London market, the most difficult of all markets, could not have been very bad. But, then, we have very little rain there, barring in an exceptional year like 1891, in which even in Kent and Surrey a good deal of hay was spoilt. In ordinary years we have about 24 inches, *including* snow reduced to water. The rainfall here is, on an average, 27½, *exclusive* of snow, as above, which is reckoned to be about 8 inches more. (1)

If, as Mr. Everett says, 400 caps are enough for 15 acres of clover, and a cap takes only one square yard of stuff at 6 cents to make, I don't see why they should not be generally used.

Heating in the stack, unless caused by the hay being carried with rain or dew on it, does not cause hay to be dusty. All our finest London clover hay, that sells for \$5 a load more than the best meadow hay, heats and ferments in the stack. The buyers would not look at loose hay of any sort.

Mr. Everett, like me, would never plough clover in, but pass it through the stock first. He thinks "there is no danger of land becoming *clover-sick*, and advises sowing liberally." If he had seen thousands of acres of clover-sick land as I have, he would change his opinion. But don't take my word for it: ask Lawes and Gilbert or any practical English farmer.

Mr. McKerrow, like me again, "believes in packing the soil after sowing wheat. The best piece of spring wheat I ever saw grown, was where a flock of sheep had tramped all over a field." Fancy a doubt existing about it in the year 1891!

Supt. Morrison says "we have better ploughs made in the United-States than any English plough." May be so, but I never saw any ploughs better for the man, and lighter draught for the horses, than those made by Howard, of Bedford, and Ransome and Sims, of Ipswich. With these ploughs, the furrow *must* be perfectly turned at the desired depth and width, unless the ploughman alters the wheels &c. on purpose. Any boy who can drive a pair of horses can plough with them, as well as the oldest and most skilful ploughman, and they are, from their construction, much lighter in draught than any swing plough, as was fully proved in 1847 (see Journal of the R. A. S. of England for that year), at the "Example farm" of Lord Ducie, under the superintendence of the well known J. C. Morton, his lordship's steward, afterwards for many years editor of the *Agricultural Gazette*.

Mr. Beach is evidently a thorough restrictionist, for he holds that "the soil of this nation should be the conclusive property of its citizens, and that no one who is not a citizen should *ever* under any circumstances be allowed the ownership of a single acre." Just so, as if we were to say: England for the English, Scotland for the Scotch, and the Scilly islands for the silly people.

Mr. Goodrich reckons the cost of each of his 20 cows,

(1) This is worthy of notice, as people here really believe that it always rains in England.

A. R. J. F.

average yield 320 lbs. of butter a year, to be as follows:

My butter netted me twenty-four cents for the year 1890. I estimate the food for a cow costs about \$30.00. I figured about \$20.00 for the labor laid out on each cow and the making of the butter. That is \$50.00 per cow. That gives me a profit of \$39.00 besides the manure.

QUESTION—Give us your figures on feed?

MR. GOODRICH—Forty pounds of clover a day for two hundred and fifty days make five tons for the year. That is worth \$1.00 a ton, that is \$5.00; a ton of clover hay worth \$5.00 and one acre of pasture to run on—I will call that \$5.00, though I think it is too much. Then one ton of bran at fifteen dollars.

MR. EVERETT—Does the quality of the food and water affect the quality of the butter?

MR. GOODRICH—It certainly does.

QUESTION—Isn't well water good enough without warming?

MR. GOODRICH—If I could have water at fifty degrees I would not be at the trouble of warming it, but where it is pumped by a wind-mill into a tank, and cold, it is different.

And, I am happy to see that he agrees with me—see p. 53 of this number, in regard to the effect of food on the richness of milk in butter-fat...

MR. MCKERROW—Do you think the milk would be just as rich on poor feed as on good feed?

MR. GOODRICH—I don't know. I can tell you some things I do know. I know that feed will make a difference in the composition of milk, and I don't care how many scientific Germans or Americans say to the contrary. I know I turned my cows out on grass one spring, but gradually stopped feeding grain. When they were having both grass and grain, 15 cows had given four hundred pounds of milk a day, making 18 pounds of butter. In two weeks after I commenced stopping off the grain, on the good grass, mind you, the quantity of milk had not shrunk at all, but the amount of butter had gone down to 15 pounds a day. I fed the grain again, and after a while brought it back to 18 pounds. I simply watered my milk by withholding the grain.

MR. BURKMAN—Is there any benefit in feeding grain when you send your milk to a cheese factory?

MR. GOODRICH—They ought to test the milk and pay for what they get.

A. R. J. F.

How are Nitrogen and Phosphoric Acid to be Obtained in the Cheapest Way?

The following is a translation (for which we are indebted to Messrs. H. and E. Albert) of a lecture on the above subject recently delivered by Professor Paul Wagner, Ph. D., Director of the Agricultural Research Station, Darmstadt.—

The question about which I wish to converse with you today is one of the most important of the whole study of fertilisation. It is also one of the most opportune, inasmuch as a series of experiments made during recent years, coupled with the simultaneous enrichment of the manure market by a new phosphate, occurring in great quantities, has now caused the question, "How are nitrogen and phosphoric acid to be obtained in the cheapest manner?" to become one of the highest importance.

It is, I presume, scarcely necessary for me to say even a word as to the importance of the above-mentioned plant food—nitrogen and phosphoric acid—in field cultivation.

You all know that plants cultivated on farms must take up through their roots at least from 100 to 200 or 300 kilos of nitrogen, and not less than from 50 to 100 or 150 kilos of phosphoric acid per hectare, equal to 89 to 178 or 267 lb of nitrogen, and 45 to 90 or 135 lb. of phosphoric acid per

acre, to obtain that quantity of harvest material which we designate "a maximum harvest."

It is also well known to you all that, as a rule, cultivated soils are not in a condition to supply this requirement of food-stuff with sufficient rapidity, even when the usual quantity of farmyard manure is regularly supplied. The manures of commerce have to be called to our help. Phosphates, nitrogenous manures, and eventually also potash salts must be applied to the soil in order to obtain the maximum harvest. Therefore, I ask you, is attaining the highest maximum harvest or producing as much as possible the sole object of the agriculturist? Primarily it is not so, for the agriculturist should endeavour to produce as cheaply as possible, and should strive to obtain the largest possible profit, and this now leads us to the consideration of the following question: How is nitrogen to be obtained as cheaply as possibly?

In the manure market we find nitrogen in the form of Chili salpêtre, ammonia salts, bloodmeal, guano, meatmeal, &c., and we must pay a mark-and-a-half per kilo (about 9d. per lb.) of nitrogen in these fertilising materials. This is

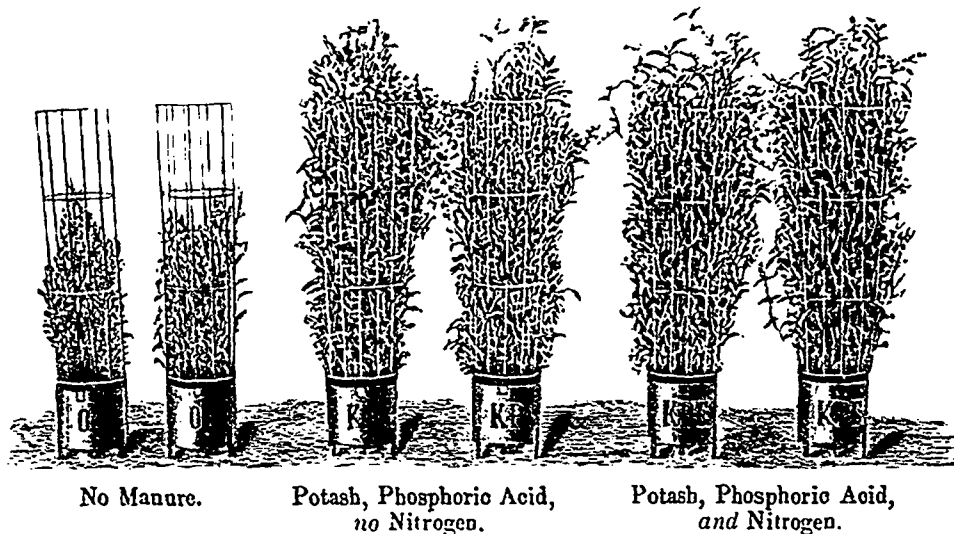
atmospheric air is accessible, if not to all, yet to a well-known and highly-important class of cultivated plants.

When leguminosæ are perishing for nitrogen, when vetches, peas, beans, clover, lucerne, csparsette, serradella, lupins, &c., have consumed the soluble nitrogen present in the soil, then, certain little microscopic fungi (so-called micro-organisms) of the soil, attach themselves to the roots of these plants and cause little warty nodules to form upon them, and from this time forward the free nitrogen of the atmospheric air takes part in the nourishing processes of the above-mentioned plants. The plants henceforth grow in a most luxuriant manner, and no longer languish for nitrogen.

The results show us most distinctly that this nitrogen, for which we must pay the manure merchant so dearly, and of which the cultivated plants have to take up not less than from 100 to 200 or 300 kilos per hectare (80, 178 or 267 lb. per acre) in order to yield a maximum harvest, is offered to us by the atmospheric air, is offered to us free of cost. (1)

Clover-like plants, all kinds of vetches, peas, beans, lupins, serradella — shortly, all plants which bear a pod fruit,

TABLE I.—EXPERIMENTS WITH POTASH AND PHOSPHORIC ACID ON VETCHES.



dear. Is there no cheaper source? Does not chemistry teach us that four-fifths of the atmospheric air which surrounds us, consist of nitrogen? Does not chemical analysis show us that humus soil and moor soil contain rich stores of nitrogen? That not less than 1, 2, or 3 lb. of nitrogen are contained in 100 lb. of dry moor substance? Certainly! we need not seek for richer sources of nitrogen. The atmospheric air offers us the nitrogen in immeasurable quantities, it offers it to us free of cost; but we must inquire, is it possible to make this rich source of nitrogen which is offered to us for nothing accessible to the plants we cultivate? (1)

To this question the researches of late years have given a definite answer of considerable value to practical agriculture, and indeed an answer which entirely contradicts previous statements.

For many years we have been told that "the free nitrogen of the atmosphere is not accessible to cultivated plants," but this doctrine was false; the researches of Professor Hellriegel, above all others, have shown us conclusively the incorrectness of it.

Hellriegel has shown us that the free nitrogen of the

which belong to the so-called "leguminosæ" are endowed with the power of availing themselves of this inexpensive and rich store of nitrogen offered by the air.

How is it, you will now ask, that there are so many fields upon which clover, vetches, peas, &c., may be seen starving? How is it to be explained that the yield of meadows is frequently so exceptionally small, even when the clover, the peas, beans, vetches, and all the numerous kinds of leguminosæ of meadow flora have at their disposal this vast quantity of nitrogen; this food which is so necessary to the profuse development of all cultivated plants?

The answer to this question is not difficult, it is simply the following effect:—meadows, clover fields, peas, and vetch fields, &c., do not hunger for nitrogen, but for phosphoric acid, and perhaps also for potash and lime. Nitrogen stands at their disposal in superfluous quantities, but they cannot take up and elaborate the nitrogen of the air as long as they are in want of phosphoric acid, potash, and lime.

If it is required to prove whether this statement is correct or not, the verification is very easy. Apply, late in the autumn or in the winter, about 15 centners (equal to 6 cwt. per

(1) A mark=24 cents, and a kilo=2½ lbs. nearly. A. J. R. F.

(1) Hectare=3 arpents nearly.

acre) of Thomas's phosphate powder and 12 centners of kainit or 4 centners of potassium muriate (potassium chloride) per hectare (equal to 4 cwt. of kainit per acre or $1\frac{1}{2}$ cwt. of muriate of potash) to a poor meadow which is only yielding very feeble crops of grass and wild herbage, &c. You will find that quite a different vegetation will be developed; even in the first summer after this treatment has been introduced. Vetch-like and clover-like plants, which otherwise only show themselves on rich meadows, and hitherto had not been observed upon the meadow in question, spring forth in vast quantities, they will develop well, and if in the following year the same manuring is repeated, then the poor and barren meadow will be converted into one thickly set with clovers. It will become a rich one, and will yield nourishing hay instead of the previously hard, herbaceous, inferior fodder.

This is no imaginary experiment; it has already been made by thousands of farmers during recent years with the best

cheapest of all supplies of nitrogen—the nitrogen of the atmospheric air.

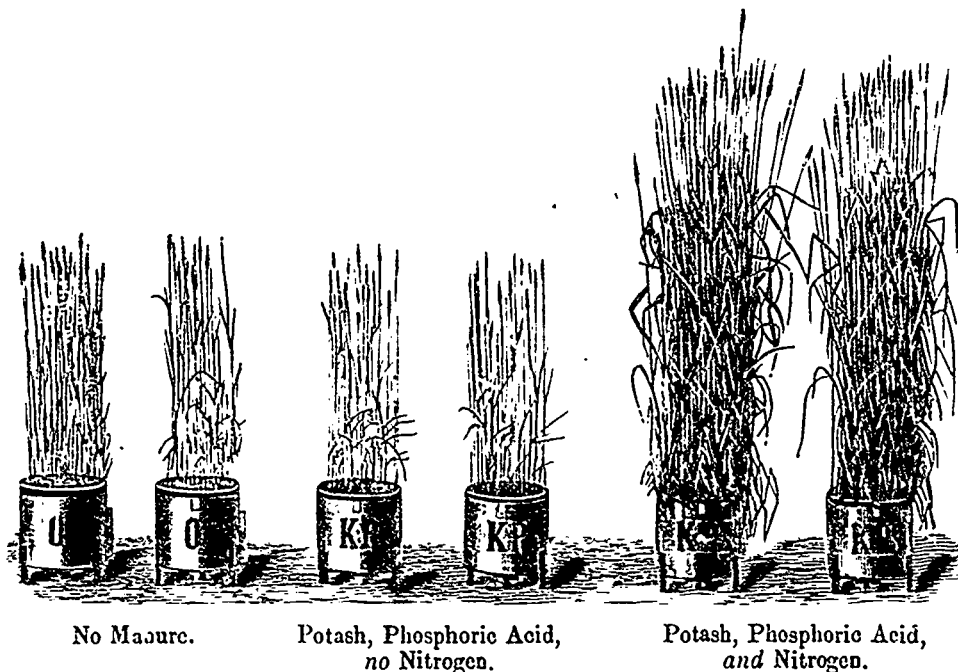
I have had prepared photographic representations of some of my cultivations, and ask you to inspect them. Table I, will illustrate to you experiments made with vetches.

You see how very feebly the plants have grown without manuring, how luxuriantly, on the other hand, they have developed after a dressing with phosphoric acid, and how this dressing, without any addition of nitrogen, has already been sufficient to produce a maximum harvest.

An addition of nitrogenous salts only gives rise to a quite unimportant increase in yield. A dressing with salpêtre and ammonia salts may therefore be regarded as a worthless extravagance on clover, lucerne fields, &c. Nevertheless Table II. presents to you quite another picture.

On the same soil and under exactly the same conditions as we employed when growing vetches, summer wheat was cul-

TABLE II.—EXPERIMENTS WITH POTASH AND PHOSPHORIC ACID ON WHEAT.



results, which have frequently been incredibly favourable, and, perhaps, all of them have already satisfied themselves sufficiently that an enormous increase in yield can be obtained by manuring meadows in the autumn and winter with potash and phosphoric acid.

I quote this experiment to you because it shows us, in such an extremely feasible manner, in which way and by which means we can bring ourselves to participate in the great advantages offered to us by the store of nitrogen in the atmospheric air. We manure leguminose with an abundant dressing of phosphoric acid, and, when necessary, with potash, for we know that the more rapidly plants satisfy themselves with potash and phosphoric acid so much the greater is the avidity with which they assimilate the atmospheric nitrogen and elaborate it into the harvest substance. We know well, and we experience daily anew, how a liberal dressing with phosphoric acid and potash will increase, in an extraordinary manner, the yield of peas and beans, of vetches and lupins, of clover fields and meadows.

Phosphoric acid and potash are the means which are placed at our disposal to render accessible to leguminous plants the

tivated. Manuring with potash and phosphoric acid alone, without any addition of nitrogen, produced no effect in this case. It was only when nitrogenous salts were also employed that any action was evident.

In order to present to you the final results of this experiment in a tangible manner for you to investigate with your own eyes, I have put the yields of grain obtained in glass cylinders and place them row before you for inspection.

The cylinders contain:—

- No. 1 — 82 grams = to 2.9 oz. of vetch corn
Obtained without manuring.
- No. 2 — 703 grams = to 24.6 oz. vetch corn
Obtained after potash and phosphoric acid.
- No. 3 — 724 grams = to 25.4 oz. of vetch corn
Obtained after potash, phosphoric acid and nitrogen
- No. 4 — 25 grams = to 0.8 oz. of wheat
Obtained without manuring.
- No. 5 — 22 grams = to $\frac{3}{4}$ oz. of wheat
Obtained after potash and phosphoric acid.
- No. 6 — 466 grams = to 16.3 oz. of wheat
Obtained after potash, phosphoric acid and nitrogen

It is therefore evident that phosphoric acid and potash are

the materials by the use of which we can render this cheapest source of nitrogen accessible to leguminosæ (vetches, for example), namely, that store of nitrogen which is presented in the atmospheric air, by the use of which we can, moreover, induce peas, vetches, lupins, serradella, sainfoin, lucerne, all kinds of clover, &c., to develop luxuriantly without any extra outlay for nitrogenous results. The enormous advantages which are hereby presented to us are so very palpable that they do not need any further elucidation.

If, for the sake of example, we observe, as is frequently the case in practice, that a manuring of Thomas' phosphate powder and kainit, costing about 30 marks, can raise the yield of hay about 100 centners per hectare (or for an outlay

manure, and the nitrogen—which has been extracted from the atmosphere by the plants constituting the green manure—will induce luxuriant development during the following summer to the cereals or potatoes which have been cultivated.

(To be continued.)

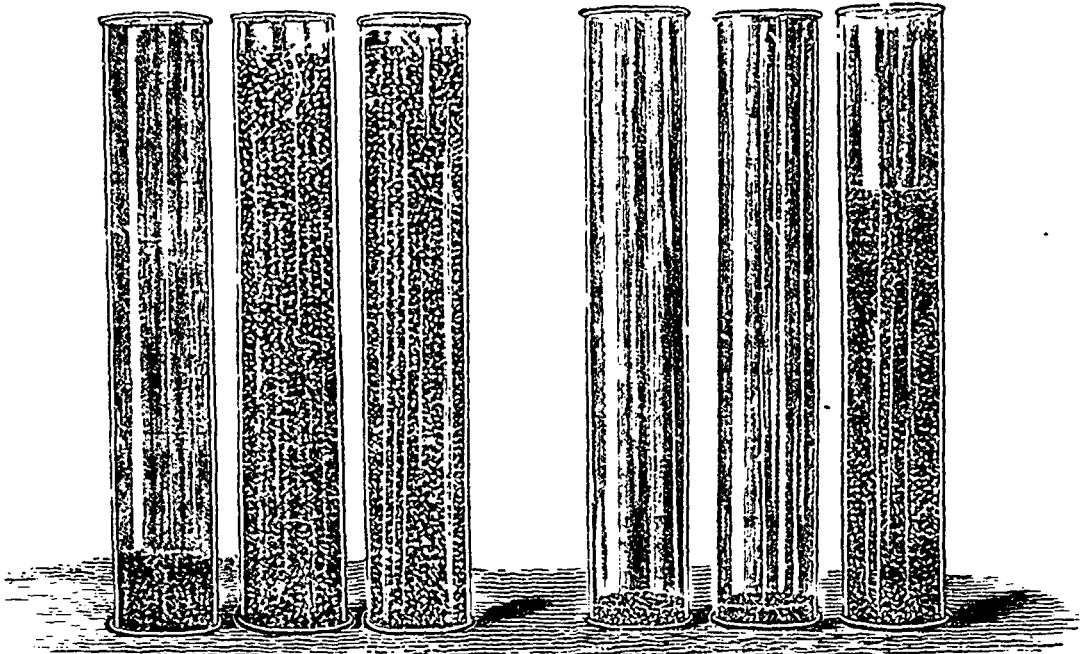
Feeding for Beef.

There were given in this paper, (*Ag. Gazette*) last week, some bits of the information which were put before the New York farmers how to feed a cow for butter. Eurottissima had 24 lb. of mixed meals, *per diem*, plus as much green meat as would keep her bowels open; and she made in one

(VETCHES.)

TABLE III.—YIELD OF THE CROP.

(WHEAT.)



No Manure.
2.9 ozs.

Potash, Phosphoric Acid, no Nitrogen,
24.6 ozs.
Increase: 21.7 ozs.

Potash, Phosphoric Acid, and Nitrogen
25.4 ozs.
Increase: 22.5 ozs.

No Manure.
0.8 oz.

Potash, Phosphoric Acid, no Nitrogen
Increase $\frac{1}{2}$ oz.

Potash, Phosphoric Acid, and Nitrogen
16.3 ozs.
Increase: 15.5 ozs.

of 13s. to 15s. per acre the yield can be raised by 2 tons of hay per acre), it is a result which needs absolutely no further recommendation.

But—I am going to ask you—are leguminosæ the only plants which we can cause to utilise the acceptable and cheap source of nitrogen (the air-nitrogen) by liberal dressings of potash and phosphoric acid? No; even those plants which are not leguminosæ, even the haulm plants, potatoes, turnips, &c., can be made to avail themselves of the inexpensive source of nitrogen offered by the atmospheric air.

Serradella, lupins, various sorts of clovers, are sown with cereals, or vetches and peas are sown in the undisturbed stubble of cereals; the vegetation developed from these seeds is ploughed into the soil during the autumn or spring as green

year, 945 lb. of butter. This is the record of some of Mr. Cannon's practices when feeding for beef: "Calves, good Shorthorns, are taken from the cow, at three day's old, and brought up by hand, and weighed at 1 p.m. every Saturday. We only limited the rations by the condition of the digestive organs. So long as these remained perfect, we did not hesitate to increase the rations. After a year's experiment we found we could rely on an average growth of 2½ lbs. per day. In one single instance, with a two-year-old bull, we reached an increase of between five and six pounds per day—187 lb. in 30 days." As to commercial feeding for beef, Mr. Cannon thus reports: "As we could get no information from farmers as to the cost of fattening steers, I took a lot of ninety steers, divided them into three lots, as equally as to weight and con-

dition as possible. One was treated as the average Vermont farmer feeds his cattle, feeding to it 3 lb. of grain and 20 lb. of hay daily, in an open shed, with a run in the yard. Another lot was kept in a warm stable, having precisely the same ration, and in addition a peck of mangels. The third lot was fed under cover, with 70 lb. of ensilage and the same quantity of grain. The temperature of the animals in the latter two lots was recorded daily. That of the hay fed lot varied, that of those eating ensilage rarely did so: and their coats had a healthy sheen that the others wanted. A Boston dealer came in the spring to buy cattle for shipping. He offered 6 cents per lb. for fifty out of ninety: to be weighed in the morning before feeding. His offer was taken. In the fifty selected all the ensilage-fed were included. For the balance the hay-fed stabled lot were culled; and he refused to take the remainder at five cents per lb.

"Now as to the cost of the winter's feeding. Reckoning in dollars, all the food at the current prices—*i. e.*, grain at 22, hay at 10, ensilage at 1½ per ton with mangels at 25 cents per bushel. No 1 (the lot fed in the yard) cost about 12 cents per day; No 2 the hay-fed 18 cents per day; and No 3 the ensilage-fed 16½ cents per day. No 1 did not improve at all in quality, were at the end rather poorer than at first. They increased in weight at the rate of 2½ per cent. No 2 increased 8½ per cent in weight and 20 per cent in quality. No 3 gained in weight 11½ per cent and improved 25 per cent in quality. "We have acted on this experiment five or six years. We find that ensilage-feeding means an economy of 6 dollars per head for winter feeding. I buy animals in the fall of the year at about 2½ dollars. I turn them out fat in May and June at about 60 dollars. In this way I feed out all the poor hay and ensilage and sell the best hay at the highest market price, and accumulate a large volume of manures to put back on the farm. Is it possible to keep up a farm except the greater part of the fertilisers is produced upon the farm, which can only be done by maintaining a heavy stock of animals?" Among other things said in the discussion was that a silo had been sealed up for eight years; and on being opened the silage was found to be not worse but better than it had been when only six months old. The ideal crop to fill a silo was said to be maize, the seed being obtained yearly from one of the Southern States. The Virginia Horsetooth was said to be a good variety; and that planting should be done at intervals of week apart. The ground should be rich, the rows 3½ ft. apart, the seed sown thinly in the rows at not more than a bushel per acre. That the horse-hoe should be kept at work as long as the horses could move between the rows: and the crop should be cut as soon as (but not before) the corn in the ear begins to glaze. G.

Extraordinary Potatoes.

A priest, a great lover of agriculture, has brought us a sample of potatoes, of its own growing, the sets of which cost him \$4.00 a bushel. These potatoes are excellent in every respect. We have had some of them cooked and can testify that they are of the finest quality. Their shape is perfect. In fact this new variety, which will be designated in future as *Syndicate No. 1*, may be considered from all points of view as a most valuable acquisition.

This variety yielded 400 bushels *an arpent*, on two arpents planted, and without any unusual cost of cultivation. We are convinced that in a good potato-year, this yield may be increased by taking every possible care.

In order to increase the diffusion of this excellent variety, we have made the necessary arrangements for its distribution at a dollar a bushel, sack included, delivered at Quebec. Our correspondent will address them properly, and put them on the cars or steam-boats going to Quebec, without additional

charge. Orders may be addressed to us, *with the price by post-office—or registered letter*, and we will take up in ourselves to see to their despatch.

Orders will be executed as soon as navigation opens, but we advise those of our readers who wish to try this new variety to give their orders as soon as possible, since the quantity for sale is not large. First come, first served.

(From the French).

ED. A. BARNARD.

Choice seed for sale.

We request our correspondents who have choice seed for sale—of any description—to have the kindness to send us samples, and to give us all necessary explanations about them, in order that we may give our readers due notice of where they are to be obtained.

(From the French).

ED. A. BARNARD.

NON-OFFICIAL PART.

Health in Herbs.

Health-giving herbs, barks, roots, and berries are carefully combined in Burdock Blood Bitters, which regulate the secretions, purify the blood and renovate and strengthen the entire system. Price, \$1 a bottle, 6 for \$5. Less than 1 cent a dose.

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All who have the care of children should know that Dr. Fowler's Extract of Wild Strawberry may be confidently depended on to cure all summer complaints, diarrhoea, dysentery, cramps, colic, cholera infantum, cholera morbus, canker, &c., in children or adults.

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Many of the worst attacks of cholera morbus, cramps, dysentery, colic, &c., come suddenly in the night and speedy and prompt means must be used against them. Dr. Fowler's Extract of Wild Strawberry is the remedy. Keep it at hand for emergencies. *It never fails to cure or relieve,*