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# THE ILLUSTRATED JOURNAL OF AGRICULTURE

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE FOR THE PROVINCE OF QUEBEC.

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### Professor L. B. Arnold and Mr Barré, on cheese.

We noticed at the time, with much regret, the very strange assertions lately made by Mr Barré, at St. Hyacinthe, as reported in our last issue, respecting American cheddar and skimmed cheese. The official position which Mr Barré holds should certainly make him more careful in his statements.

It will have been observed that Mr Barré went so far as to assert that the Americans had lost their good name on the English market, on account of their shipments of poor skimmed cheese, and that, in consequence, they had brought on a decrease in their annual exportations to the amount of fifty million pounds. Mr Barré also stated, to our amazement, that it was very difficult to distinguish poor skim cheese from full cream when just fit for the consumer! The letter from Professor L. B. Arnold, undoubtedly the highest acknowledged authority on cheese and cheese-making in North America, which we print below, shows conclusively what value must be placed on Mr Barré's statements:

### MR E. A. BARNARD,

Dear Sir, — I enclose herewith a somewhat extended article for so small a journal as yours, whose columns must always be crowded with more than they can hold. The pressure of work upon me compels me to write in haste, or I might perhaps have shortened it somewhat, (By no means! *Editor*). I hope it may have the effect of correcting the wrong impression given to your dairy association. If so, I shall be satisfied. If other queries arise hereafter, you are at liberty to forward them, and I will explain as best I can. With much respect,

L. B. ARNOLD.

Many thanks for your very kind offer, which will certainly be taken advantage of, for the benefit of our readers.—ED.

ROCHESTER, N. Y., DEC. 28TH 1832.

*Ed. Journal of Agriculture.*—The following quotation, taken from a printed report of the deliberations at the late convention of the Dairymen's Association of the province of Quebec, is offered to your always interesting Journal, with a few comments:

"A fact which deserves our most serious consideration is

that the Americans have lost their good name in the market on account of their skim cheese, of very inferior quality. As it is very difficult to know the difference (between full cream and poor skim cheese), when cheese is sold in a fresh state, the result has been that the consumers, once deceived, purchased elsewhere. The Americans have thus caused their cheese sales to decrease, to the amount of FIFTY MILLIONS of pounds!"

What is so confidently set forth in the quotation as an important and significant fact, is not a fact at all. The Americans have not "lost their good name in the market." Since the introduction of cheese factories, American cheese has been steadily gaining in favor with English consumers, and is to day in better repute than ever before. It is but a few weeks since the Live Stock Journal, of England, published an article acknowledging the high quality of American cheese, and that it averages better than the cheese of England. The Agricultural Gazette, the Mark Lane Express, the London Grocer, and other leading English papers which are in a position to know, have every now and then published similar statements. Professor J. P. Shelden, the most eminent English authority, takes the same view of the merits of American cheese in his "Dairy Farming" published in 1880.

F. B. Thurber, of the firm of H. K. and F. B. Thurber and Co., New-York, heavy dealers in butter and cheese, and who have a house in Liverpool and are perfectly familiar with the standing of American dairy goods, said, in an address before the New York State Dairymen's Association, at Cortland, December 20th: "Our cheese manufacturers began years ago to study the tastes of English consumers, and they have gradually perfected their product, until most Englishmen will now admit that the best grades of our American cheese are equal in flavor and texture to those made in Great Britain, but they still claim a great superiority in the keeping qualities of English cheese."

This statement of Mr Thurber's, which corroborates the opinions of leading men, published from time to time, expresses the real sentiments of the English in regard to American cheese.

Expressions like those in the report referred to originate with interested parties for a purpose, and only find an echo with those who are unable to comprehend the situation.

The main assumption in the report being without foundation, the inferences which follow are also groundless. That the amount of cheese exported from this country has fallen off since 1879 is conceded by all, but the decrease is nothing like the deficiency named in the report, and has no connection whatever with the cause there assigned. The current of trade is pretty well indicated by the yearly exports of cheese from the United States, a table of which for the last years follows:

1864.....	47,751,329
1865.....	53,089,468

1866	36,411,985
1867	52,352,127
1868	51,097,203
1869	39,960,367
1870	57,296,327
1871	63,698,867
1872	66,204,025
1873	80,366,540
1874	90,611,077
1875	101,010,853
1876	97,676,234
1877	107,364,666
1878	123,783,736
1879	141,654,474
1880	127,553,907
1881	133,410,222
1882	108,389,192

When there comes to be added the exports from New York, to November 30th, the exports from New York for December, and the large shipments from Northern New York, which have gone by way of Montreal and been reckoned with Canadian cheese, and the amounts sent from Boston and other ports, the total will not be very far below the exports of previous years. Exports have fallen off from New York during 1882, chiefly from a diversion of trade to other ports.

The foregoing table shows fluctuations in our exports of cheese, which are often wide. These changes are not due either to the failing or improving quality of our cheese, but to the variation in prices at home. When butter or cheese is high in our own markets, exports run down, and when they are low, exports increase, more or less according to the depression of prices. At the present time, and during 1882, butter has been unusually high in the United States, and our exports of that article have run down to almost nothing. The Dairymen's Committee might as well have charged that our diminutive shipments of butter were due to oleomargarine, as that the declination in cheese exports was due to skim cheese; whereas, the whole cause of declination in exports of both butter and cheese lies in the fact of higher prices at home. Both are steadily improving in quality and quantity, but the consumption of both is increasing so rapidly, that the demand crowds the supply so hard as to force prices up above the views of shippers: our own citizens out-bidding them on all high grade goods.

All our best butter and most of our best cheese is consumed by our people at prices above those which shippers can pay. For example: according to market exports by Hodgson Brothers in the *Agricultural Gazette* of London, best butter in Liverpool, December 16th 1882, was 160s per 112 lbs, equal to 34 5 cts per lb. Best butter in New York at the same date was 45 cts. Canadian and American cheese, highest quotation in Liverpool 66s = 14.2 cts per lb. In New York 13.5 cts, a difference equal to less than half the cost of exporting. With prices thus related, exports must, and do, dwindle until the lower grades are reached, for which the English are willing to pay more than the people on this side of the Atlantic. In such a relation of prices, it must be plain, the cause of our diminishing exports lies. If prices should fall on this side of the ocean, as they did in 1879 when cheese came down to 5 cts to 7 cts a pound and the United States sent 141 millions abroad, a similar expansion of exports would occur again. No: neither our skim cheese, nor our poor full cream cheese, nor our lard cheese, nor the inability of consumers or exports to distinguish one from the other, has any perceptible influence in molding the magnitude of our exports, except as each helps to make the total

of poorer goods large or small. The more low grade goods we have the more we export, the facts and causes being exactly the reverse of what the dairymen's committee have asserted. The English buy our goods as they do Canadian—on their merits—they give what they are worth to them, and are not injured or deceived as to their value, however they may have been made. The deception from which English consumers suffer most is when they are bled with an extra price for American or Canadian cheese sold to them for English make.

L. B. ARNOLD.

Snowflake, Mich. Dec. 19th 1882.

ED. A. BARNARD, Cap St. Michel, P. Q.

Dear Sir,—Your kind offer of 14th inst. is received. Will mail free on receipt of \$1, the following collection:

- 10 Ailanthus 4 to 6 in.
- 10 White Ash 4 to 6 in.
- 10 Arbor Vitæ 4 to 6 in.
- 10 Hardy Catalpa 4 to 6 in.
- 10 Teas Japan Catalpa 4 to 6 in.
- 10 Yellow flag Catalpa 4 to 6 in.
- 10 Black Locust 4 to 6 in.
- 10 Box Elder 4 to 1 in.
- 10 Norway Spruce 1 to 2 in.
- 10 Austrian Pine 2 to 3 in.
- 10 Corsican Pine 2 to 3 in.
- 10 Wis. Weeping Willow cuttings.

And am prepared to furnish as many as you may wish to order. This gives 12 varieties, 10 each, 120 plants, delivered free, all for \$1. Yours truly,

W. W. JOHNSON.

Mr Barnard has at various times received plants from the nurseries of Mr Johnson, of Snowflake, Michigan, and is satisfied with his manner of conducting his business. The price of the trees mentioned in the above list is almost absurdly low. With proper care in setting out, the smaller the young trees are the better for their chance of taking root.

*Gregory's Illustrated Catalogue*.—We have received Mr Gregory's list of vegetable, flower, and grain seeds. The celebrity of this gentleman's establishment is too great to need any addition from our pen. The squash, cabbage, and early corn grown, and we may say invented, at Marblehead, are the best of their sorts.

St Denis, (below) P. Q., 11th November, 1882.

This is to certify that the bearer, Mr John Skaife, of Montreal, has studied the art of butter and cheese making, and practiced the same under my personal instruction and has become competent to manufacture both butter and cheese of the best quality.

Also, he is competent to take the charge of a factory in the above named capacity and I take pleasure in recommending him as being honest, faithful and industrious, and any community wishing to obtain the services of a man as a first class butter and cheese maker, will do well to employ Mr Skaife.

J. M. JOEELYN,

Official Instructor in butter and cheese making for the province of Quebec, Canada.

Mr Skaife, whom I have had the pleasure of knowing for some time, has passed through a full course of two years study at the Agricultural College, at Guelph, Ont. This, alone, must make him a valuable acquisition to any locality where the farmers are desirous of information concerning the best and most modern methods of cultivating land.

ARTHUR R. JENNER FUST.

**Hampshire-Downs at Islington, Eng.**

At the Christmas Show of the Smithfield Club, these sheep again made their mark. The question of their superiority as regards early maturity may now be considered as definitively settled. It is very much to be regretted that no man, no body of men, has shown sufficient interest in the welfare of the agricultural population of the province to import a few of these most useful sheep. The price is not out of the way: a good ram lamb can be bought for £10, and ewes would cost about £4 10 a piece. Not show sheep; but honest farmers' stock. The ram should, of course, be selected from a family not too nearly related to the ewes.

The following is an analysis of the live weights of the lambs exhibited at Islington; three to each pen:

Cotswolds .....	595
Leicester.....	558
Lincoln.....	616
South-Downs.....	525
Shropshires.....	451
Oxfords.....	460
Hampshire Downs.....	672

And from this list, I deduce the following most important facts: That the Hampshire-Down lambs were superior in weight to all the others, and not by a trifling amount either, as the next table will show:

**Weight of Hampshire-Down lambs**

672 lbs	= weight of Cotswold lambs	+ 77
"	= " " Leicester "	+ 114
"	= " " Lincoln "	+ 56
"	= " " Southdown "	+ 147
"	= " " Shropshires "	+ 221
"	= " " Oxfords "	+ 212

And more; while the Southdown wethers weighed 682 lbs, the Hampshire-Down lambs weighed 672 lbs; the former having only 10 lbs per pen of three, or 3½ lbs each, to show for their twelve-month's food! Again; we see by the table two Hampshire-Down lambs weighed as much as three Shropshires, and nearly as much as three Oxfords!

Lastly, the pen of three Hampshire-Down lambs exceeded in weight the pen of three Southdown ewes (3 years old) by 56 lbs!!! The difference between the weight of the Hampshire-Downs and the Southdowns I was prepared to see, but I must confess I was astonished at the amazing superiority of the former over the Shropshires and the Oxfords. Judging from my own past experience of sheep in the state of fatness in which they made their appearance at the Smithfield Club Show, I believe I am not wrong in taking 65 0/10 of live weight as the weight of the four quarters; which would make their value in the London market, at present prices, £7.6 sterling, or \$36.00! Most of my readers know, by this time, that in the English markets, all cattle, &c. are sold by hand, and the price of mutton is so high now in that country, that a good Down sheep weighing, when slaughtered, 20 lbs a quarter, is worth one shilling sterling a pound, or \$20, as he stands. I have no hesitation in saying that as long as prices keep up to what they are now, no more profitable system of farming can be offered to the Canadian than the breeding and fattening of sheep for exportation, if the sort of sheep suited to the trade of the west-end of London be selected. Hampshire-Downs lambed in March, and moderately pushed from weaning, should weigh, by the time the first boat leaves for England in the Spring, something like 12 stones, or 96 lbs, and would bring in the neighbourhood of twenty-four dollars, and there is only one secret in their management in this country: *rape, rape, rape*, from the 20th of June to the end of the season. It would add at least one-third to the yield of our farms.

A. R. J. F.

Mr Bruce Campbell, of St. Hilaire, has sent me a letter, which appears in this number of the Journal. It is rather difficult to answer without going over the land he speaks of, but I will state my own ideas on the subject, assisted by some hints from Mr Barnard, Director of Agriculture, whose long experience gives his opinion great weight.

I fancy the sheep would do very well on the mountain, but I doubt their agreeing with juicy young trees. Elms would stand well alone, and ash, but would not solitary maples, drawn up as they are in their present state by their neighbours, be likely to be blown down? If I meant to clear the hill, I should leave, here and there, belts of trees, say 40 yards wide, as guards against the prevalent winds, first taking out the largest timber, but leaving the remainder thick enough. This would have another effect: it would prevent the washing of the naked parts from heavy rains, ending in land-slides, and causing the denudation of the soil, leaving some places bare to the rock, and accumulating an unnecessary depth of earth in others.

Mr Barnard thinks that the cultivation of timber would be more profitable, in such a tree-less district, than sheep-farming. I have no doubt he is right, but I infer from the questions Mr Campbell asks that present profit is desired.

One shepherd, a boy, and two good dogs, should render fences unnecessary. As to whether sheep-farming would pay, I have answered that question in my article on Hampshire-Downs in the present number. The sort of sheep I should recommend, to start with, would be the native ewe coupled with a short woolled ram. They are jumpers, but that is the shepherd's look out. Of course I look forward to the importation of a ram and half a dozen ewes of the Hampshire-Down breed, and their gradual substitution for the natives—after three crosses, very few signs of the parent stock would survive. The Hampshire-Downs can be kept in flocks of any number—I have seen 4000 in one lot in the same fold—long-wools and the crosses must be kept in small lots; which is another count in favour of my darlings. Low sheds, open on one side, would be sufficient protection in winter. Sheep don't care for cold, but they don't like wet jackets. Bedding of any kind is unnecessary except in lambing time—sheep lie on a road in preference to the turf on each side of it. Dryness is what they want; a damp air, as the Scotch call it, causes foot-rot.

*Preparation of the land.*—"Some excellent rich land, some thin and poor." Peter must be robbed to pay Paul. The rich land with a light ploughing would grow rape, and the sheep, fed on this during the day, might go to fold at night on the inferior soil. If the hurdles were made after the fashion of those depicted at page 182 of the 2. vol. of the French Journal, a boy could set the fold for 500 sheep in about ½ an hour. I don't think even the native sheep would jump them, if they were made 3 feet 6 in. high. The cost is a mere trifle, as the wood is on the spot, and any handy fellow could make them.

A mixture of grass-seeds should be sown with the rape, and then would the sheep-walk be established for ever. A dressing of 10 bushels of slaked lime to the acre would improve it very much. The following list of grass-seeds, I think, would answer:

	lbs
Perennial rye-grass.....	10
Smooth meadow-grass.....	2
Cocksfoot Orchard-grass.....	5
Meadow fescue.....	3
Hard ".....	3
Meadow foxtail.....	2
Red clover.....	4
White clover.....	4
Cow-grass (perennial red clover).....	4

Kept fed down, and never allowed to go to seed, most of these are *really* perennial.

In spots where the native grasses already exist, the above-mentioned dressing of lime would bring up plenty of white clover, and no ploughing is necessary. The inferior land, after folding two seasons, might be broken up in its turn, sown with rape and grass-seeds, and dressed with lime. The two foldings would do wonders for it, and no manure would be necessary. Eight pounds of rape per acre, broadcast.

This pre-supposes that a moderate outlay at first is contemplated. If, on the other hand, the grass is expected to come of itself, I cannot, without inspection, tell how long it might take to form a turf fit for keeping any number of sheep. I know that the plan I have traced will in two seasons secure summer food for a large stock. But the winter is the difficulty. The lambs, except those

as a Sheep-Ranche, is the splendid opportunity afforded by the configuration of the land for establishing irrigated meadows. I was amazingly struck by the sight of the mill-stream, when I visited St. Hilaire, for the first time, in 1860. The creation of water-meadows all down the slope from the lake—here 4 acres, there 3 acres, and so on—would settle the question of winter-keep for sheep, at once. The immediate neighbourhood of the stream is, I dare say, rocky; but there could be no difficulty worth considering in leading the water half a mile or so, and the brook could be tapped at more places than one; while at the bottom of the slope, below the last mill, the whole bulk of water would be available. And the best of it is, that, owing to the great fall, no bed work would be necessary, all could be done by the simple catch work plan, a specimen of which may be seen in the Journal for August, 1880.—When once a turf is



GUERNSEY BULL.

reserved to keep up the ewe flock, must be made fit for the butcher by the end of the season. No doubt, pea-straw can be bought cheaper than other food, and it is most useful, combined with other stuff. A flock of one hundred ewes would require 4 tons of cotton seed cake, which would cost, at present prices, \$150, one and a half dollars per head, of which one third would be recovered in the manure. We must not forget that the land would be improving immensely every year under this treatment, and would eventually, say in three years, carry a very heavy stocking all the months from May to December; for sheep can lie out much longer than cattle, and it is wonderful how well they do with a mere picking for a living.

But the really glorious part of Belœil Mountain, regarded

established, and the land judiciously laid out and watered, all doubt about a hay crop is over. Our season is quite long enough for irrigation on the catch-work system—we could begin in September, about the 20th, and go on till the first signs of the ground being frozen—this for the autumn floodings: Spring work might begin as soon as the ground was thawed, or even before—at all events by the first week in May, and continue till the grass was some five or six inches high; and a three days "drowning" after the first crop was out, would give a second cut in the latter end of August. If well managed, the crop from the two cuttings should equal 2½ tons. After Spring-flooding, sheep should not go on the water-meadow, as I have known it rot them—when only autumn-flooded there is no danger. In Devonshire

and Cornwall, Eng., I have seen, early in February, the ewes and lambs up to their knees in grass in the irrigated meadows, when all around them there was nothing but a brown sterility. A good water meadow, there, lets for £4 an acre, when the rest of the farm is not worth more than £1.

ARTHUR R. JENNER FUST.

#### OUR ENGRAVINGS.

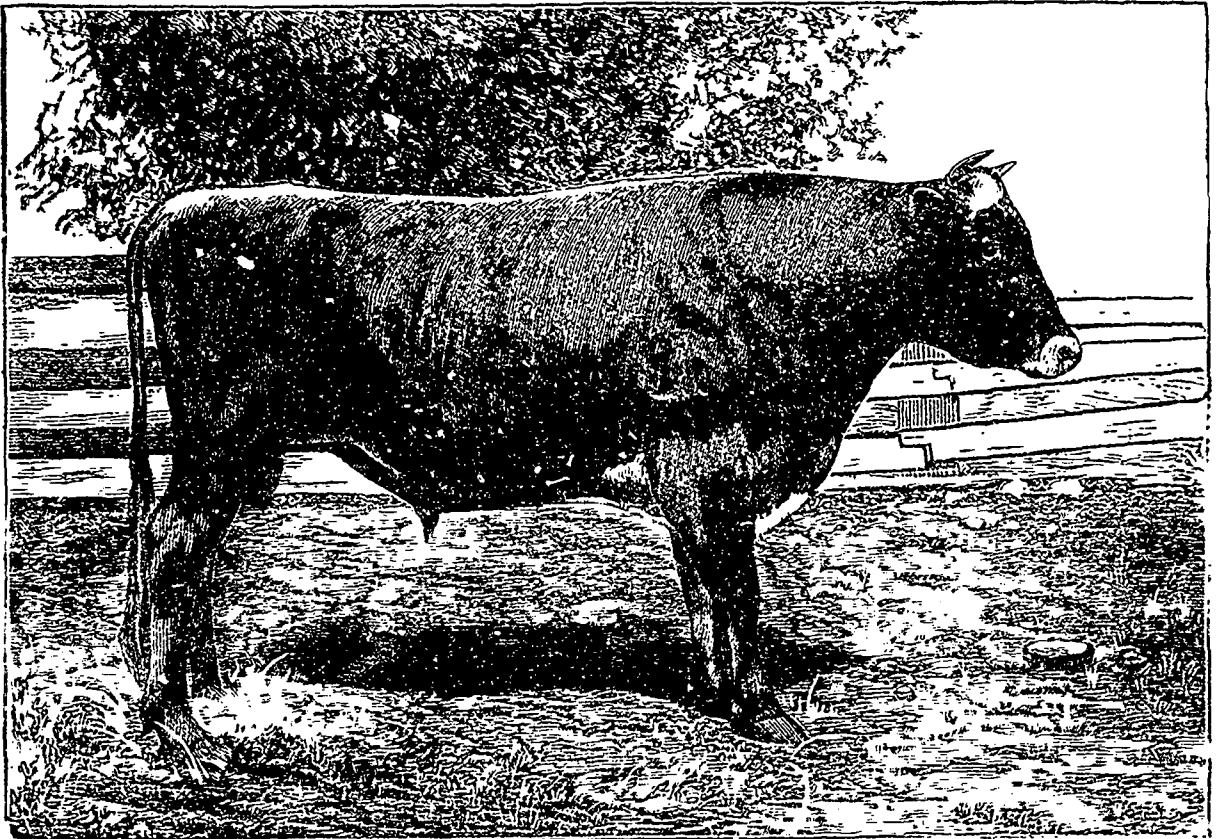
Guernsey Bull; Reburn's Jersey Bull; Hampshire-Down sheep; Illustrations of Mr Jocelyn's Factory apparatus.

#### Guernsey Cattle.

Mr Abbott, of St. Anne's, has just bought the first prize bull of this season in the island. A moderate price: only

trance door, which is half way down the silo-wall on a level with the cattle-stalls—here, it is slightly mildewed. The clover, unfortunately, was not cut into chaff, and the stamping or treading down was not sufficient. Consequently, some air was retained in the interstices of the clover, and a patch or two, here and there, turned mouldy. But, as a whole, it is excellent, and one has only to look at the lazy fat brutes of cows to see how well they do on it.

"Monday morning began giving 45 pounds of ensilage, a piece, to 3 cows—within from 2 to 3 months of calving—increased quantity of milk given by the 3 cows at the two milkings on the following Saturday, 10 quarts!" And they were well fed before the ensilage was used, Mr Dawes, like his people at Lachine, being liberal to all his stock, and not believing in feeding cattle only twice a day.



Mr REBURN'S JERSEY BULL—First in his class, 1882.

£190 sterling, which will bring his cost, landed at St. Anne's, up to about \$1400.00! There will be no heifer calves to spare from Mr Abbott's herd this spring; but, I think, if the cows behave well, one or two bull-calves may be had at reasonable prices. Strange, that nobody seems to have seen these cattle. I hope to get a couple of photographs from the herd as soon as the winter is over, and, then, I am sure the G. T. R. will have to put on extra cars to accommodate the St. Anne's traffic. Mr Reburn's Jerseys and Mr Abbott's Guernseys ought to attract a host of visitors.

A. E. J. F.

And when at St. Anne's, I should recommend every one to see Mr Mark Dawes' silo. The corn, cut into  $\frac{1}{2}$  inch lengths, has kept to perfection, except just round the en-

The Southdown ram, which took the first prize at Mile End in September, is vastly improved; his neck is wonderful for a Southdown, and his legs of mutton have become more rounded! Mr Dawes is increasing his flock and is purifying it from the taint I mentioned in my article on the Exhibition, by getting rid of the two half-bred ewes; v. J. for October 1882. A. R. J. F.

#### BORO-GLYCERIDE.

Attention is called to a short article from the Agricultural Gazette, Eng., on this valuable antiseptic. Mr Spencer, the writer, is the celebrated breeder of prize pigs, and what he says is to be depended upon.

Hampshire Downs, again.—"The clumsier-looking but quite invaluable Hampshire Downs mustered strongly at



Islington; Mr A Morison as usual, is invincible with his wethers, under 23 months; the heavier pen weighed 976 pounds.

In Shropshires, Lord Chesham takes all the 1st prizes and one 2nd. The weights, however, and quality are below the Hampshire-Downs. The 1st prize Shropshire wethers, under 23 months, weigh 788 pounds, i. e. 188 pounds less than the Hampshire-Downs.

Mr Albert Brassey takes three out of the seven prizes for Oxforas. The top weights of these big looking sheep are, however, below the Hampshire-Downs—964 pounds being the weight of the best pen of 3 year old wethers.”

AG. GAZETTE, ENG.

Mr Stratton's Shorthorn heifer Lillian cleared the road at Islington for fat beasts. She won 1st for best female, 1st for best in her class, breeder's cup, and 1st for the best beast in the yard.

TO THE EDITOR JOURNAL OF AGRICULTURE.

Dear Sir,—It is our intention of taking off Belcoil Mountain a considerable portion of lumber, leaving all 5 inches diameter trees. Now, can we turn a portion of this Mountain with advantage into a sheep ranch? Will it be necessary to enclose the portion we intend to convert into a ranch? Will the mosquitoes affect the sheep. Would a couple of shepherds do as well as a fence? How should we go to work preparing the part of the Mountain in question? Some parts are very rocky, other parts excellent rich land. Would sheep farming pay? What sort of sheep would be best adapted? How should they be housed in winter, and how fed? Hoping to receive answers which can give one sufficient practical information so as to be able to go to work and meet with success, I remain yours truly,

BRUCE F. CAMPBELL.

First Steps in Farming—Young Man's Department—

We have seen, roughly it is true, the process by which digestion is carried on in the internal economy of the animal. I pass over, for the present at all events, the more intricate subject of the digestibility of foods, for, though the German investigations on this point afford much information, I feel convinced, from the addresses I listened to at the meeting of the American Association in Montreal last September, that the matter is not yet as fully cleared up as we may expect it to be at some future time. But it is necessary before we go further that you understand what is meant by "albuminoid ratio" of food. It is the proportion which exists between the digestible nitrogenous (albuminoid) and the digestible non-nitrogenous matters therein contained. For the purpose of calculation, all the non-nitrogenous matters are reduced to their equivalent in starch: thus the amount of fat in any food multiplied by 2.44 gives its equivalent of starch; 10 of milk sugar multiplied by .9 equals 9, its equivalent of starch, &c.—So, we find in our common farm-foods the following proportions:

Cotton cake, decorticated.....	1: 1.5
Linseed cake.....	1: 2.3
Beans .....	1: 2.4
Pease .....	1: 2.9
Oats.....	1: 5.5
Indian corn.....	1: 9.0
Clover hay.....	1: 5.9
Meadow hay.....	1: 8.0
Swedes.....	1: 5.9
Mangels .....	1: 8.0
Potatoes.....	1:10.6
Wheat straw.....	1:64.4

The following table is important, as showing the average results obtained with the sheep, the goat, and the ox—all ruminants—when fed upon the stuffs mentioned above. You will observe that all the ruminants possess four stomachs, besides the intestinal organs. In experiments on different foods; it is necessary to allow a certain time to elapse before each change of diet. In the case of an ox, five days, perhaps, will elapse before the remains of the former food will have been completely got rid of:

DIGESTED FOR 100 OF EACH CONSTITUENT SUPPLIED.

Food	Total organic matter	Albuminoids	Fat	Sol. carbohydrates	Fibre
Linseed cake...	80	81	90	78	doubtful
Beans.....	90	88	93	03	"
Oats.....	71	79	84	76	24
Barley.....	81	77	100	87	doubtful
Indian corn....	88	79	85	91	"
Wheat bran....	67	75	50	70	37
Meadow hay....	59	56	47	62	57
Clover hay....	59	55	56	60	44
Lucerne hay...	59	76	38	67	40
Oat straw.....	51	38	36	43	61
Wheat straw...	46	20	36	39	56
Bean straw....	5C	51	35	60	36

You will observe, that turnips, beets, and potatoes, are not mentioned in the list; they appear to be almost, if not quite perfectly digested. Remark, also, the four cases in which the amount of fibre is stated as "doubtful." The whole subject, as I said at starting, requires many more experiments before perfect knowledge can be arrived at.

Wheat straw is evidently less digestible than oat straw. In fact, allowed to ripen thoroughly, as our wheat is here, the straw is worth very little indeed. Oat straw is cut greener, but pea-straw, if cut early, is not only more digestible, but is a richer food both in albuminoids and in carbohydrates. Pease are generally allowed to stand much too long in this country: the straw becomes almost rotten. Whenever the straw and pods become brown, pease should be cut at once. In Scotland, in damp, growing seasons, I have seen the crop cut when the lower part was quite green; but the pease, when threshed were plump and well nourished. I don't think the straw is half valued enough. If people could be only persuaded to sow pease in drills 27 inches apart, and horse-hoe them once or twice, I am convinced that, with the aid of plaster, the yield would be nearly doubled. For this system, 3 bushels of seed per acre are necessary. As pease are sown now, half a crop is all that can be expected, and hardly that is the ordinary result. The influence of the quantity of water consumed by an animal is very much more emphatic than is generally supposed. Should a sheep drink as much as an ox in proportion to the food consumed, and if not, why not? A bullock, with his slightly covered skin, sweats copiously, and a sheep with his wool on does not sweat half as much; consequently the ox gets rid of more water than the sheep does, in the proportion of 2:1.

When sheep are feeding off turnips in the field, as is the rule in England, if the weather is warm it is hardly worth while giving them chaff, as they won't look at it. But towards winter, when the first frosty mornings make their appearance, the sheep may be seen standing about, waiting for the arrival of the shepherd with his sacks full of clover-chaff, which they eagerly devour the moment it is put into the troughs. This is the practical result: does it agree with theory or not?

The average consumption of a sheep in the open air is 20 lbs, about as many pints, and 6 as lbs are sufficient liquid for a sheep each day, it follows, that the animal takes 14 lbs more than enough. Now, the turnips are abominably cold—

frozen hard frequently, as I have often experienced out shooting, when, after a hard day, I have tried to bite one, and have been obliged to carry it in my bosom to thaw before I could succeed. The 14 lbs of water, then, must be raised from nearly freezing point, 32° F., to the temperature of the sheep's body, about 96° F., and this rise in temperature, of at least 64°, must be accomplished by means of the food he eats. It will take 1142 grains of carbohydrates, burnt in the animal's body, to effect this, equal to about 6 0/10 of the total food consumed. This is not all, for the waste of food will be augmented by the amount of water lost in sweat, and the combustion of 1426 grains of carbohydrates is required to vaporise, as sweat, 1 lb. of water at the temperature of the animal's body.

Again, the more water drunk, the greater amount of albuminoids oxidised in the body, and excreted by the kidneys as urea: consequently, a loss of nitrogen is incurred by any superfluous imbibition of water. We see then, that the practice of supplying animals eating cold roots with a proportion of dry food, by which the consumption of water is diminished, is confirmed by theory.

Observe that: A horse digests the nitrogenous constituents of hay nearly as well as a sheep, but falls short in digesting the non-nitrogenous parts: that the value of bulky food, like hay or straw, is far greater when given to ruminants, than when given to horses or pigs: concentrated, easily digested foods, have a value far above their apparent composition when added to a poor bulky food, like chaff or turnips, because they raise the diet to a point at which the animal can thrive: again, roots, tares, green-meats in general, may have a useful effect when given moderately in addition to dry food.

Next month, I shall enter upon the subject of the general feeding of animals on the farm, beginning with the calf and the lamb.

ARTHUR R. JENNER FUST.

MR. ED. A. BARNARD.

Dear Sir,—In answer to your question relating to what I said at St. Hyacinthe in regard to skimmed cheese, I beg to reply, that I did say that there was a time when full skimmed cheese, sold for more than the best full cream. My authority for this statement is found in the report of the New York State Agricultural Society, for 1865, page 249.

It is in a paper by the late honourable X. A. Willard, and contains a very full and interesting account of the whole Orange County system of dairying.

I do not wish it to be understood that this is the case at present, for it has been learned that a cheese thus closely skimmed will not keep as long as one with more fat; but it is also a fact that one partly skimmed will keep better in any climate than one made from all new milk, and I did say that partly skimmed cheese, properly made, sold ahead of full cream cheese that was faulty in making, and for as much as the best. Yours truly,

J. M. JOCELYN.

St. Denis, (en bas) P. Q. 19th Dec. 1883.

EDITOR OF JOURNAL OF AGRICULTURE.

Dear Sir,—Owing to what I believe to be a want felt by a large number of farmers of this province, I herewith send you a description of an apparatus, of my own invention, for the manufacture of cheese on the farm.

To begin with, I do not mean to recommend the farmers, who live near a properly situated and well conducted cheese-factory, to withdraw or withhold their patronage from the same, but I would advise them to do all they can to sustain

and encourage it; but to those farmers who do not have this advantage, I beg to present, through the Journal, some facts and suggestions, which, if acted upon, will very much increase their income without adding much to the expense of the farm.

The home consumption of cheese is increasing each year, and the farmers who are situated to make cheese at home, will find a local market for a large amount; and it would give them much more profit to make cheese and butter, than to make butter alone. (There are several farmers in the vicinity of Montreal who make cheese, and find a ready market for the same). I say butter and cheese, because the ordinary farmer cannot take all the butter out of the milk, neither is it possible to work it all into the cheese.

With the means at the disposal of the average farmer, it is difficult to obtain 4 pounds of good butter from each hundred pounds of milk, on an average, through the season; and, consequently, there remains about one pound in the butter-milk which is fed to the stock at a great loss.

Again, by letting the milk stand in order to get all the cream possible, it generally stands too long, and the quality of the butter is very much injured thereby; whereas, if there are both butter and cheese made from the same milk, it must be skimmed before it stands too long, in order to have the milk suitable for cheese, and thus the butter would be very much improved, and would consequently bring a much better price.

In fact, there is no reason why the butter should not be equal to the best creamery make.

The markets of the world are, and for the past ten years have been, glutted with inferior butter, while fine butter is and has been in good demand at fair prices; hence it would be wise to make less in quantity, of a better quality, and make cheese of the rest.

In old times, butter was bought up indiscriminately, good, bad, and indifferent, all at the same price, but "the world moves," and today butter ranges in price, in all the principal markets of the world, according to quality.

In New York for instance from 15cts to 40cts, and it is not to be supposed that in future there will be any greater demand for second quality butter than at present.

While very fair butter can be made at the rate of 4 lbs for 100 lbs of milk, with careful attention to all the details, with the same amount of care, much finer butter may be made where only half the cream is taken, because the largest and best of the fat globules rise to the surface first, and these make butter much superior to the smaller ones.

Again, the smaller globules of fat work very readily into the cheese, while it is the largest and best that separate and run off in the whey, when all the cream is attempted to be worked in.

Nearly all the cheese made in England is made on the farm, and the famous English Cheddar cheese is made from partly skimmed milk, and it is only the very best American or Canadian cheese that competes with it in the English market.

Now, with the above facts before us, I will proceed to describe the apparatus and mode of using, so that any person of ordinary intelligence if not a practical cheese-maker, can go ahead and make cheese: but, where it is possible, it will be much better if they can go and take a few lessons of a good practical cheese-maker.

The whole apparatus can be got up, large enough for the milk of as many as forty cows, for about thirty dollars, and it is more convenient than any that I have seen costing three or four times that amount; and besides, it may be readily turned into a vessel for cooking the roots for stock or heating water, and also a most convenient place for setting the milk



for raising the cream: so I trust I shall be pardoned for naming it the "Multum in Parvo."

Figure "A" is a side view of the apparatus, all closed up when not in use, or when in use as a storage box for the milk. "1" is the curd sink, used as a cover, "2" is the water box or heater, "3" is the brick work, or furnace, and "4" is the wooden frame that goes round the top of the cheese vat to strengthen it.

Figure "B" is an end view of the same, showing the door for putting in fuel, also the stove pipe hole "15".

Figure "G" is a view of the heater or water box (marked "2" in figure "A"). The dark part represents the tinned iron bottom, which is nailed on the lower edge of the box (the points being well laid in white lead), with  $1\frac{1}{2}$  inch tinned nails and the heads well soldered over, to prevent leaking.

The box is made of any good well seasoned lumber,  $1\frac{1}{2}$  thick, as is also the wood work for the whole apparatus.

The outside measurement may be as follows, and would have a capacity of 800 pounds of milk, while the heater would be capable of heating 75 gallons of water or of cooking

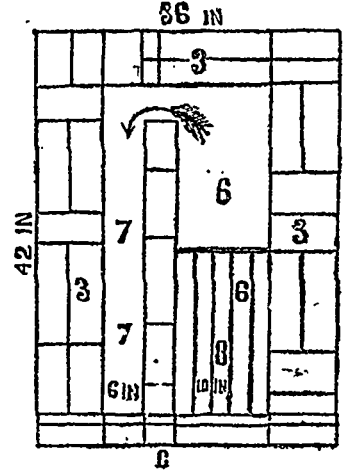
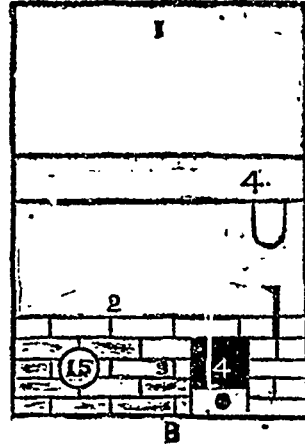
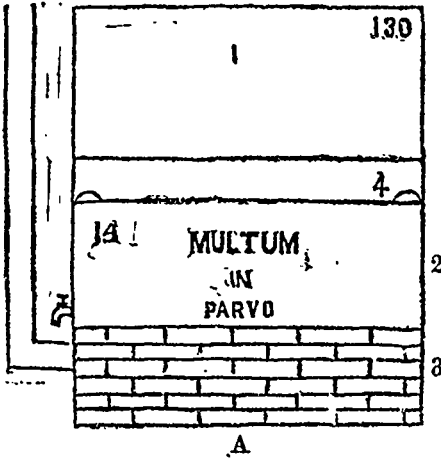


Figure "C" is a view of the brick work with the whole top removed as we are looking down into it, "3" is the brick work "8" is the grate, "6" is the fire-place and "7" is the return flue, the smoke passing out at "15" see figure "B".

Figure "D" is a view of the apparatus open, ready for business. The curd sink is turned down on a strong bench, "10", and the whole remains in this position until ready to take out the curd and put it in the curd sink, when one end of the cheese vat may be raised as shown in the dotted lines.

8 bushels of roots. The brick work  $36 \times 40$  inches and five bricks high. Under the fireplace the floor must be taken out, and stone or sand filled in to make it safe.

The heater the same dimensions and 14 inches high. The cheese vat rim  $36 \times 42$  and 6 inches wide, and the vat just crowds inside of this, and is, consequently, only  $33 \times 39$  inches, and is 19 inches deep; thus, leaving a space of one inch between the bottom of the vat and the bottom of the heater. The cover is  $36 \times 42$  and 20 inches deep, and is the curd

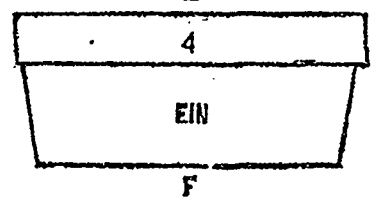
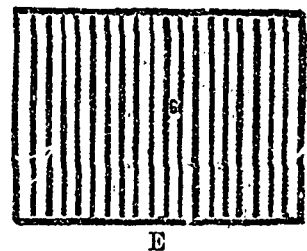
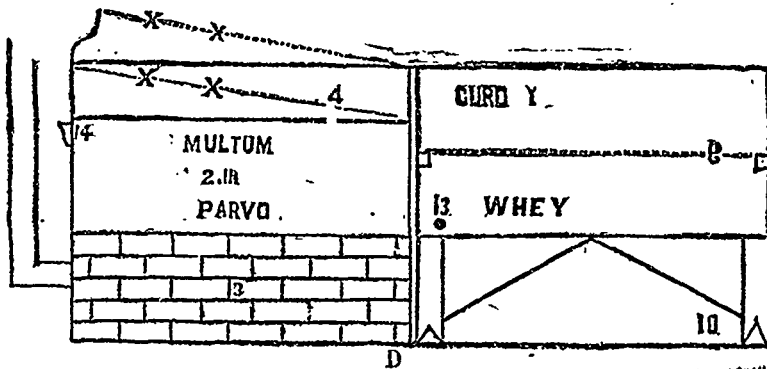


Figure "E" is a view of the rack which rests in the curd sink half way down on a couple of cleats, and is represented by the dotted line "9" figure "D".

Figure "F" is a view of the cheese vat which sits in the heater "2", figure "A". This vat is made shorter at the bottom than at the top by some three inches, but in width, it may be nearly equal at both top and bottom.

sink cover and temporary whey vat all combined. — Figure "H" represents the mould which may be of a size to suit the convenience of the farmer, but it should be so large that the diameter of the cheese will be more than the height, and the mould should be 14 inches deep and  $\frac{1}{2}$  inch less in diameter at the bottom than at the top. — It should have a bottom of the same material as the body of the hoop, (i. e.

tinned iron of the best quality, and not less or lighter than 24 gauze), and several small holes to allow the whey to escape.—The bottom must be put on in such a manner as not to enlarge the mould at the lower end, so that one mould may telescope into another, when more than one cheese is pressed at a time.

Figure "I" represents the filler and bandage, which is made of tin 16 inches high, with a flaring rim 3 inches wide. This filler should be of the same shape as the mould, but  $\frac{1}{2}$  inch less in diameter, and open at the bottom. Figure "J" is a view of the press, 12 is a cleat firmly fastened to the wall of the room, and 16 is the lever to which hangs the weight "8"—"17" represents the moulds with the cheese being pressed, there being two cheeses pressing at the same time. (1)

When there is but one, the lever is put under the lower cleat.—The moulds sit in a box "19", which catches all the whey that runs from the cheeses, and may be emptied when the cheeses are taken from the press.

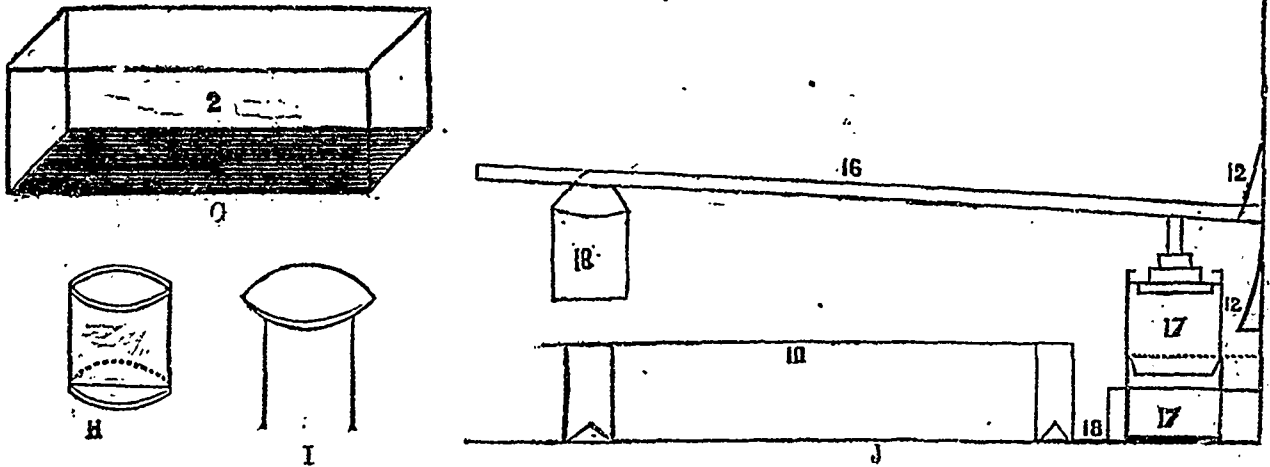
Care must be taken that the pressure is applied directly over the centre, in order to have the cheese perfectly even.

In addition, we require a curd knife, a flat sided pail for dipping the curd, a large dipper, a scoop, and a linen curd strainer.

through in this manner two or three times, open up the draft, and heat slowly up to the required temperature, which will be from 90° to 98°, according to circumstances and season. All the while the heating is going on the curd must be worked as above mentioned, or with a rake made for the purpose.

When it is heated sufficiently, put out the fire, and if the water has become very hot it will be necessary to draw that off also and put a pailful of cold water under to take the heat. Now keep the curd agitated in the whey until the acid acid begins to develop, which may be known by the taste and smell, also by the hot iron test.

Just as soon as the curd will draw in fine threads the tenth of an inch long on an iron heated up to 250° F. (or a little hotter than boiling water or a steam pipe), it may be thrown out into the sink to drain and develop a further amount of acid.—Before throwing out the curd, the strainer may be thrown over the vat and one half the whey dipped off, the curd remaining under the cloth; and after the cloth is turned over into the sink, and the curd with the rest of the whey is all dipped out, the whey passes through into the bottom, and may be drawn out at "13" at the convenience of the operator. In the mean time, the curd must be kept



All being ready, with the apparatus set up as shown in figure "D", pour about 10 gallons of water into the heater through the funnel "14", and turn the milk into the vat.

Now take light wood and build a fire in the furnace, (which by the way is 10 inches wide, with return flue 6 inches wide, and brick partition between, the fire passing round as indicated by the arrow), and heat up the milk to 80° F. and then shut the draft closely, or put out the fire. Now stir the milk slowly about five minutes and the heat in the water and brick will run it up to about 84°. If colouring is used, put it in the milk at this point and next apply the rennet, sufficient that the milk will begin to thicken in about 15 minutes (seeing that nothing but the best quality of rennet is used), and when it becomes hard enough to cut smooth, and the whey follows the knife, cut it, as near as may be, in pieces half an inch square.

Now, as soon as the curd settles so that the whey covers the whole surface, bare the arms to the shoulder, and turn the curd *very carefully* from the bottom (the object being to keep the curd from adhering together), but do not mash the curd by squeezing it in the hand, but keep the hand open and the fingers in motion, and after it is worked

thoroughly stirred in the sink, until the threads are from  $\frac{1}{4}$  to  $\frac{1}{2}$  inch long, and then it may be salted with fine sifted salt at the rate of 2 $\frac{1}{2}$  to 3 lbs of salt for 100 lbs of curd and put to press at as near 76° as possible.

Now take the filler and draw the bandage over it, having it plaited around the bottom so it will lap-in about 1 $\frac{1}{2}$  inches all around. Put a circular piece of heavy white cotton cloth, just the size of the mould, in the bottom of the mould, and gently let the filler down in the mould clear to the bottom.

Now pour in the curd, and gently press it down with the hands, and then with a sudden motion, lift out of the filler, leaving the bandage in the mould round the curd. Then, put on the top of the curd a piece of cotton similar to the one in the bottom, and make a roll of cotton cloth like a rope, about  $\frac{1}{2}$  inch in diameter, long enough to round the edge, and place this on the top of the curd. Next, put on a circular piece of board fitted nicely to the size of the hoop, and on this put another with the grain running across that of the first one.

Now set it in the box "19", and put on the blocks and adjust the lever and hang on the weight.

If the lever is 10 feet long, 100 lbs weight will be sufficient to press two or three cheeses at a time.

(1) "The tea is making."—Macaulay's English.

After the cheese has been in press three or four hours, it should be taken out, the bandage nicely pulled up and adjusted, and turned upside down and put back to press, where it should remain until the next day, when it may be taken out and put on a smooth shelf, rubbed with the palm of the hand and greased and turned over each day for the first 10 days, and after that, 3 times a week will be sufficient for turning and greasing until it is about 30 days old, if the room has been kept at a temperature of about 70°.

To change the apparatus into one for cooking roots for stock, just take out the cheese vat, and it is all ready. Here you have a vessel as convenient as you can wish for; large enough for the purposes of almost any farmer, and by putting on the cover and running a steam pipe from "13" out into the open air all the steam and the disagreeable smell will pass outside. This is a great consideration; as all kinds of food can be cooked, and none of the inmates of the house will be annoyed by the smell.

For a heater for water, it would be very useful on washing and cleaning days; and at butchering time, they would all find it just what is wanted, and no farmer would part with it, when he once learned its value. It is not patented, and costs but a trifle when we consider its usefulness, and requires no extra amount of skill to set it up. Any ordinary mechanic can make it, and very much may be done by the farmer himself, thus reducing the cost to the merest trifle.

There are many points more that I should like to touch upon that would be useful to the beginner, but space will not permit this time, and I shall be glad to help any who may get bothered, if they will apply for information by letter through the Journal.

J. M. JOCELYN.

St. Denis (en bas), P. Q 21 Dec. 1882.

On looking over some of the back numbers of the Agricultural Journal, I see that one of your correspondents considers that the Canadian cattle are more profitable than the Shorthorns. I suppose he means the small French breed. Possibly he may think he is a good authority and is considered a good farmer in his own neighbourhood, a man of intelligence, and considerable influence; but he evidently knows little of agriculture beyond what he learned from his father. No doubt, there are circumstances where the farmer might find the small Canadian cattle more suitable than the common native cow kept by most of the Eastern Township farmers. Perhaps your correspondent, like many another farmer, pastures his cattle upon land that will no longer grow grain or hay of a good quality, or on some land that has never been cultivated since the timber was taken off, one half producing little else than raspberry bushes and ferns, the other half stumps and stones. Three fourths of the pasturage of this country is of this character, fit for goats or Kerry cows only. No experienced farmer would expect a profit from Shorthorn cattle grazed on such land, animals of their size and weight to make them profitable must have all they can eat without having to travel far for their food.

However, there is no wonder so many of the farmers of this country should know so little of their own profession when they take so little trouble to gain information; for I believe there is not one in a hundred who ever reads an agricultural paper, and at their meetings they would rather not hear agriculture discussed.

It need not however surprise any one when our public and wealthy men take so little interest in the improvement of Agriculture—the wealth of the country.

How can it be expected that our Agricultural Colleges will increase the knowledge of the farmer, carried on as they are with such limited allowances? Can it be expected that a

farm of only eighty acres of land will support sufficient stock necessary to teach young men the difference between the different breeds of cattle, horses, sheep and pigs, the various crops, a system of rotation, fattening and soiling of cattle, use of artificial manures, and the different systems and appliances for dairying?

A young man does not want to be taught theoretical farming only, but a thorough economical system of breeding, feeding and the raising of young stock, and fitting him either to farm for himself or to manage for capitalists who wish to invest in land. I am quite satisfied that there is not a young man who has left one of these so called Agricultural Colleges that is capable of undertaking the management of a large farm, and give to the proprietor that advice necessary to the choice of stock suitable to that particular property. How could he manage the cultivation of a large farm, choose the necessary crops that should succeed each other according to the condition or quality of the soil, those that are required for the summer and winter feeding of cattle whether for fattening or milking purposes?

There is no doubt that in some of these colleges young men are receiving a good education free of expense, that will enable them to take up any of the learned professions, but surely this is not the intention of the government. To make these Colleges of any benefit to the Agricultural community they must have a larger grant, or unite them all in one. Place them under the control and guidance of a thorough practical Agriculturist, who is well acquainted with the several systems carried on in Great Britain. Every College should be compelled to keep the best of improved stock, and sell them at such a price, that the farmers of the country can buy them, and not allow the farm to be made a speculation of to make money by. New varieties of grain should be tried, and if found to answer, distribute them to the neighbouring farmers. Improved implements for cultivating the soil should be kept, so that farmers could see what implement would suit them. Farmers hear and read of the great production of milk by various breeds of cows, of the great increase in new varieties of grain and roots, of the improved breeds of sheep, pigs &c., also of economical cultivators, such as potato diggers, grain binders, and many other implements. But how are they to judge of the value of the various productions, unless they have an opportunity of seeing them tested? Few farmers in the province of Quebec can afford to purchase these things on the chance of their turning out what they are advertised to be. What greater benefit, I would ask, could a Government confer on a country than that of enabling these Colleges to carry out such a work, and seeing that it was well done? How much benefit does the farming population of the country gain by the large expenditure of money by Agricultural Societies and their exhibitions? The system adopted is a bad one. The same few men meet once a year, almost in silence, elect the same men as directors with very little change, and these men, it will be found, are those who take nearly all the prizes, year after year. There are very few societies that purchase breeding animals for improving the stock of the country, or improved varieties of seeds for distribution among the farmers. Some societies purchase seeds for the farmer, and the amount is put down as a subscription and enables the society to draw the Government grant. The same old variety is however purchased year after year, for were they to buy any quantity of an expensive kind, however good, the farmers might possibly not purchase them, and so they would lose so much money for distribution at the exhibition. Other societies have not given a prize for grain or roots for years, and have never given the prize for the best cultivated farm. Have any of the societies reported on the value of the artificial ma-

nures distributed by the Government? Surely, the Government or the Council of Agriculture should see to the management of these societies. Some man who is a practical Agriculturist of good standing in the country should be appointed to superintend these Societies and Colleges, see that the accounts are properly kept, visit every exhibition, and make reports to the Council of Agriculture, which reports should be published in the Journal.

Fill the situation with a good man, and there will soon be a great change for the better in these institutions, to the great benefit of the country.

I have thus suggested a few subjects which may engage the attention of some of our leading Agriculturists, of manifest importance to the farmer and the public, and I would call upon the agricultural interests of the country to weigh the matter with deliberation. I would in particular address those who are just entering upon the business of life, who are anxious not only to acquire fortunes, but reputations for public usefulness, and who are to give a character to our agriculture in coming years. "Nothing" said an ancient Sage "can be more despicable than an old man, who has no other proof of having lived long in the world than his age."

It should be the object of our ambition that we should all signalise the period of life allotted to us by some exertion either mentally or bodily, which may be useful to mankind, and give us a claim to their remembrance, to their respect, and to their-gratitude.

AYLMER.

Melbourne, Jan. 1883.

TO ARTHUR R. JENNERFUST,

Dear Sir,—On account of absence from home till yesterday I did not receive your letter in regard to price of cotton seed, and I, with much pleasure, answer the best I can.

It is true we have a good cotton crop, but from the fact that cotton seed oil is being so generally used in cooking in place of hog's lard, the product has increased in price, and consequently, the raw seed is no cheaper than last year.

I saw two cotton seed buyers on my return. They are paying, delivered in sacks on the bank of Arkansas river, \$9 (nine dollars) per ton of 2000 lbs., the mills furnishing the sacks. On the Miss. river, they pay \$10. (ten dollars) per ton.

I cannot say what will be the charge per car load from here to Montreal or Boston, of that you can enquire of freight-agents in Boston. My impression is that it will be cheaper for you to purchase the oil cake; and if it is not ground, it will be impossible to adulterate it.

I do not know what the oil cake sells for, but you can write to the oil mills at Little Rock, Arkansas, as I think you can purchase cheaper there than in Memphis. My son in law, I. G. Johnson, lives in Little Rock, and he will take pleasure in assisting you. You can also write to W. M. Watkins, Memphis, Tenn., 708 Main street (tell him I wrote you), and he will give you all the information you wish. He will purchase and ship for 2½ 0/0.

I do not think the Mills adulterate the meal here; but to be sure, the cake can be shipped as cheaply as the meal, and then ground when received.

I feed to my sheep the raw cotton-seed which I have been able to purchase at the gins not sacked, \$3 to \$4 per ton. It cost about \$2 per ton to sack and deliver in the river; this will be this year to me \$7 per ton.

I have here as good a stock farm as there is in the South. But I have no capital to purchase stock.

I am anxious for a party with \$3000 to \$5000, and I will guarantee him 12 ½ 0/0 per annum on all the capital he will put in.

If you see any one who wishes to invest any money in this, please let me know.

I can give the best of reference to business men in New Orleans, Nashville, or Little Rock.

If I can assist you in any way I will take pleasure in doing so. I have been absent 6 months in Tennessee and Kentucky studying stock raising, and think I have learned the fact, that cattle, sheep, and horses, can be raised for one half in the cotton states that they cost in the Northern states.

With much respect

I am your's truly,

Arkansas Post, Arkansas  
Nov. 23d 1882.

J. H. MOORE.

Dear Sir,—In reply to your letter of 29th Nov. in reference to cotton seed meal and its uses, I beg to hand you herewith a pamphlet issued by the Meal Exchange, which will give you all the information you may desire.

The quotations for cotton seed meal or cake, c. o. d., in car load lots, is now \$20.00 per ton of 2,000 lbs. Prices are subject to change, but my impression, judging from the large crop made, and a decline in prices of seed, is, that any change from above figures will be in favour of buyers.

Meal is put up in 100 lbs bags, cake in 200 lbs bags. There is no question of the purity of meal you may buy in this market, but if you prefer, you could buy the cake and grind it to suit yourself. I may also add that mills here will grind meal coarse or fine as parties ordering may elect. Freights to Boston are \$8.00 per ton, and to Montreal would hardly be in excess of this.

The mills of this city, Little Rock, Nashville, and Columbus, Miss. compose the meal exchange, and, hence, prices would rule same at all points.

It is hardly necessary to write more fully upon the subject, as the paper I mail you contains all the information asked. If, however, there is anything more you desire to know, I will cheerfully write you, and if you conclude to order meal or cake I shall be glad to have your order at the figure mentioned. Very respectfully yours,

W. M. WATKINS.

Arthur R. Jenner Fust, Montreal, Canada.

We call attention to the letter of Mr. W. Costigan. If every one in his separate locality would follow the good example set by that gentleman, our country parts would soon be reclothed with verdure; and the horrid nakedness which characterises some parts of the Townships would give place to a warmer and more comfortable aspect.

TO ED. A. BARNARD, ESQ,

Dear Sir,—As requested in circular of 5th ulto, I am pleased to advise having planted on Saturday 14th Oct. about twenty trees, comprising 4 Butternuts, 3 Maples, 3 Elms, 3 Beech, 2 Scotch Firs, 2 Horse Chesnuts, 2 Acacias, 1 Iron Wood, and on Saturday last, 18th instant, I put in one hundred and twenty one Walnuts.

On the first occasion, I took out with me to the lot on Lower Lachine Road a party of seventeen young folks, representing nine different families, and had a most enjoyable "ARBOR-DAY", as it was delightfully fine weather.

The above being a matter of pleasure, I enclose \$2.00, the yearly subscription.

Yours truly

(Signed)

Wm F. Costigan.

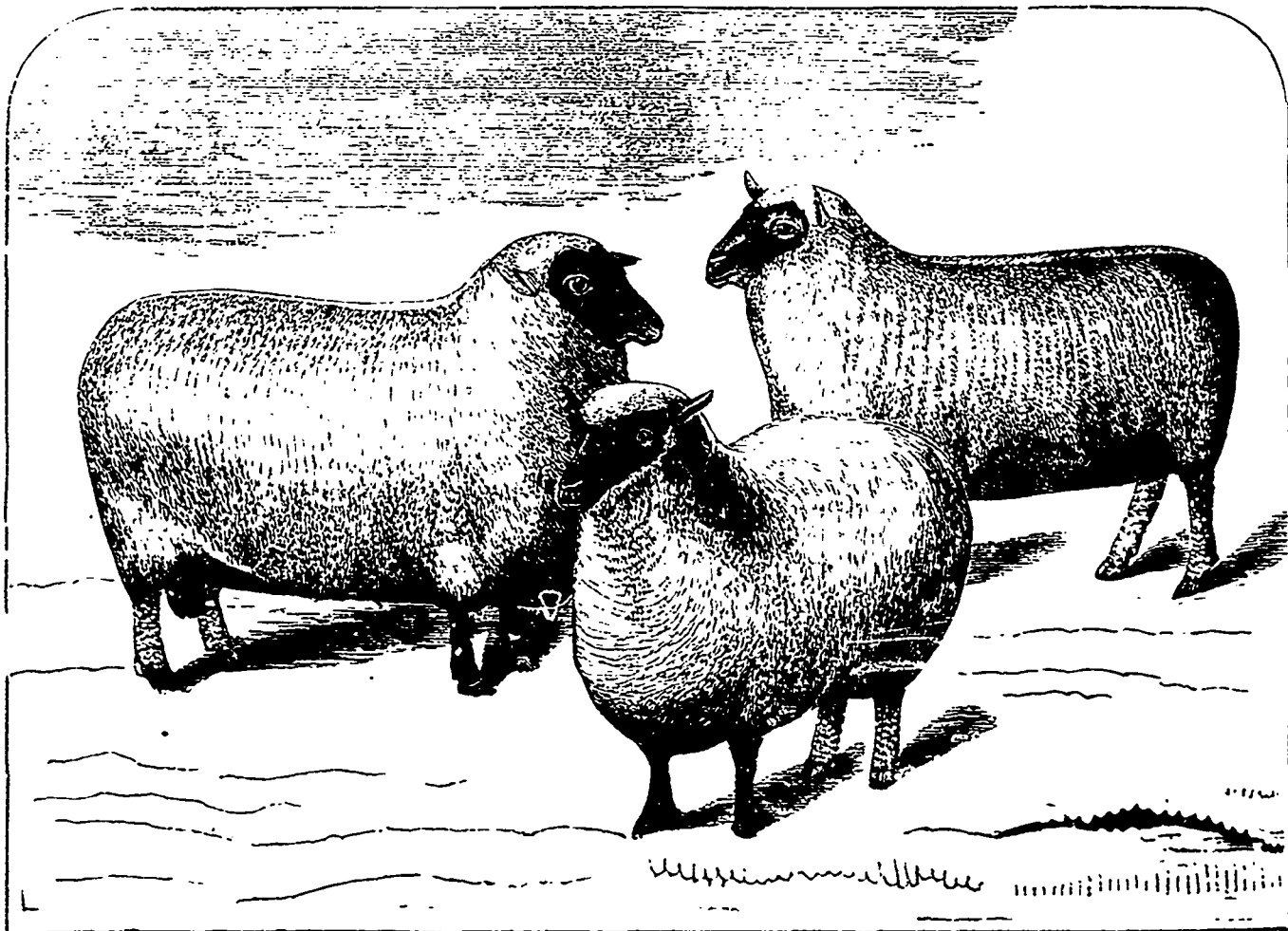
Montreal 24th Nov. 1882.

### The best Implements!

To the *Rural New Yorker*—Your number of Dec 30 has just arrived, and is perused, as usual, with pleasure—I must sympathise with Mr. D. E. Stevens, of Kansas, and admit that his strictures, which apply to all respectable agricultural papers, are perfectly legitimate. How comes it that the best agricultural papers in the land cannot honestly and usefully advise as to the real comparative value of agricultural implements—offered in the market every day and every where? Who, to save his life, could honestly and conscientiously say which is the best sulky plow offered for sale? Who has, or have, made the necessary comparative tests—scientific and practical, in order to solve such problems? It

One of the most important features of the *Royal Agricultural Society of England's* invaluable work has been, for many years, the thorough test of agricultural implements. These tests, when necessary, are continued, from year to year, under the very best authorities in Europe, and the decisions have such weight that they are accepted, generally, on all sides.—The subdivision of labor is such that, in about five years, all classes of useful implements have been tested thoroughly and publicly reported on.

Why should we not unite in America, and organize a thoroughly *National* test of agricultural implements, under the best possible management? Why should we not without farther loss of time, work with a will towards the solution



HAMPSHIRE-DOWNS.

strike me that the agricultural interests of North America—throwing in Canada, are of such importance that leading agricultural journalists should have at their command some authoritative and satisfactory answer to Mr. Stevens' query, and to all questions of a similar nature.

We have, yearly, innumerable fairs: International fairs:—National fairs;—State fairs:—District, County or Township fairs, where, generally, any number of prizes are offered for agricultural implements:—And yet, where and when have we, in America, thoroughly scientific and practical tests of such implements as should be in daily use by farmers all over the land?

of such problems as every farmer in the land is directly interested in having solved?

Might not agricultural writers, in America, take up this subject of thorough tests for all useful implements, and keep it stirring until some proper solution be obtained.—

Ed. A. BARNARD.

Montreal, Canada.

### Beans and Corn.

E. A. B. writing from Cap St. Michel, Quebec, asks: "Where can I get the best seed of field corn for our province? What variety do you recommend? What should

it cost per quart? You recommended last year a variety of beans for orchard culture. Please describe them and give the selling price. An answer in the VERMONT WATCH MAN will oblige."

The best field corn for northern Vermont and Lower Canada is unquestionably the small eight-rowed variety, which sometimes goes by the name of "Canada eight-rowed corn." The season, except near Lake Champlain, does not admit of the regular and perfect ripening of any variety of this cereal that requires more than three months, or one hundred days, for its growth and maturity. This variety of corn, though with small ears, produces as good crops as any of the larger sorts, making up for lack of size by the number of the ears. It is more costly to grow only because there are more ears and so more husk and shell to make the same measure of grain. The productiveness of any variety of corn, as well as its earliness and other qualities, vary considerably according to the care exercised, through a longer or shorter time, in the selection of the seed. The oldest and most thoroughbred sub-variety of the Canada eight-rowed corn with which we are acquainted is the one we had some seven or eight years ago from A. M. Foster of Cabot, who procured it from the farm of Judge Pearce of Calais, where it had been grown continuously since the "cold year" of 1816. Great care had, in all that time, been exercised in its selection. It had been well cultivated, but not over-manured, and its characteristics had become very thoroughly fixed, so that often in a whole crop one ear with more than eight rows could not be found. It is a prolific corn, with a very uniform tendency to produce two full ears to the stalk. Since we obtained it, it has probably had rather higher manuring than formerly, with the result of lengthening the ears from seven or eight inches to nine or ten inches. Our largest crop has been at the rate of ninety-two bushels of dry shelled corn to the acre, and the average not less than seventy-five bushels. When we got it, it ran about three hundred ears to the shelled bushel. Now it requires not more than two hundred and fifty. The cob is small, the kernel rather large for the variety, and it dries out very quickly, so that we have always had it in perfect order for grinding by the first of November. The color is uniform, a medium yellow, and it makes a very handsome meal. Seed corn of choice varieties usually sells in Vermont, we believe, at about one dollar per peck, or three dollars per bushel. At this price only perfect ears are used, and the tips are removed.

The variety of bean to which E. A. B. refers was probably the Improved Yellow Eye, which has now almost entirely replaced in market the old Yellow Eye. This improved variety is much rounder and whiter than its predecessor. It originated in Maine, and is grown in that state extensively, both for sale to the lumber camps and for shipment to the Boston market. It formerly sold at about fifty cents a bushel higher than the old Yellow Eye, but has become so common that it is now quoted at twelve to fifteen cents higher. The fact is, that the old variety is now nearly out of the market. The latest Boston quotations are \$2.12 to \$2.20 for the Improved Yellow Eye. This variety is very early, ripens with perfect uniformity, does not vine, rust, or spot, and does not split easily under the flail. It is also very productive on good land.

#### Cotton Seed and its Uses.

One of the marked features of the past few years is the great interest that has been excited in regard to the economic value of cotton seed. This product has long been highly esteemed as a valuable fertilizer, though the method of using it has been careless and wasteful in the extreme, so that probably not more than half of its value in this respect was rea-

lized. Its chief value as a fertilizer is due to the large percentage of nitrogen in the seed. This nitrogen very easily escapes into the atmosphere when the seeds are exposed to the weather in the old fashioned way for the purpose of rotting and thereby preventing germination. A great saving was effected in this respect by the adoption of the system of composting the seed with stable manure and acid phosphate, the latter preventing the escape of the ammonia evolved during the decomposition. But it has long been known that the oil contained in the seed is of no practical value for fertilizing purposes, and so far back as the year 1834, the first move was made toward the extraction of the oil and its introduction into the market for purposes for which it was believed to be suited. However, it was not until the year 1855, that the feasibility of the manufacture of cotton seed oil was demonstrated. Since that period, and especially during the last few years, the number of oil mills has greatly increased, and the business is assuming large proportions. The following extract from my *Supplemental Report of 1881*, published in January last, gives some interesting facts in regard to the business, and the importance of this newly developed source of wealth to the farmers of Georgia:

#### PRODUCTS OF THE OIL MILLS.

The first step in preparing the seed for the mill is the removal of the lint left by the gin. This is done by a gin constructed for the purpose, with saws closer together than in the ordinary cotton gin. An average of twenty-two pounds of short lint is taken from a ton of the seed. This product, called "linters," brings, on the market,  $6\frac{1}{2}$  to 7 cents per pound, and is used in the manufacture of cotton batting.

The next product is the hulls, which are removed from the kernel, and used as fuel for the engines which furnish the power for the mills. The hulls constitute about half the total weight of the seed. From their combustion result two qualities of ashes, averaging in price at the mill \$12.00 per ton.

The mills average a yield of thirty-five gallons of crude oil to the ton of seed, which wholesales at the mills at 35 cents per gallon. This loses in the process of refining eighteen per cent.—so that the yield in refined oil is 28.75 gallons. The refined oil sells at the mills at 55c. to 60c. per gallon.

A ton of the seed yields, after extracting the oil, 700 lbs. of oil cake or cotton seed meal, which is simply the cake ground. The cake or meal at present sells at the mills at \$20.00 per ton. The average consumption of the mills is about 6,000 tons each per annum. The mills generally operate only about six months in the year, and hence their average capacity is 12,000 tons per annum. The consumption is, therefore, 350,000 tons per annum, with a capacity for twice that amount.

#### The Maintenance Ration.

Prof. G. C. Caldwell, Ph. D., Professor of Agricultural and Analytical Chemistry; Cornell University, then proceeded to read his paper on "The Maintenance Ration." He said that this so called maintenance ration may be regarded as an important foundation stone of the whole system, if not indeed the corner stone; if it is once indisputably established what must be the composition of the ration required to keep an animal in *statu quo* without gain or loss of weight for a considerable period of time, then it is indisputably established that a richer ration, or one of a different composition, must be given in order to get any production of animal substance, or that, on the other hand, if a poorer ration is given, the farmer is wastefully using up animal substance as fast as his animal loses weight.

Guided by the results of a small number of feeding experiments, in which the composition of the fodder was ascer-



tained by chemical analysis, the amount of its several constituents digested was ascertained also by comparing the composition of the fodder actually eaten with the composition of the solid excrements and by a few others in which only the effect of a ration of known composition on the animal was noted. Wolf has given us as the approximate required composition of the maintenance ration for a full grown beef animal:—75 lbs. of digestible albuminoids, 825 lbs. of digestible non-nitrogenous matter, and a nutritive ration in which the digestible fat is reckoned as equal to  $2\frac{1}{2}$  times its weight of starch of 1 part of digestible albuminoids to 11 or 12 of digestible non-nitrogenous matters, and with a total of 14-15 lbs. of dry substance in the ration; this is the acquirement per day for each, 1,000 lbs live. weight. Prof. Sanborn in feeding experiments at the New Hampshire Agricultural College has found that steers have gained for 49 days continuously on half as much albuminoids and three-fourths as much non-nitrogenous matter; and on what was very nearly equal to the maintenance ration given above, he has got 1.37 lbs. of increase in live weight per day; or steers have grown well on a ration in which the nutritive ration was 1.12, and in another instance have gained 6-7 lbs. daily on a nutritive ration of 1.21. He thought that results so widely at variance with the German estimates startled specialists, for if they were accepted, the whole system of calculated rations based on those estimates must fall, and a new one be made, at least so far as the United States were concerned. The importance of the subject demands much experimentation in the same direction. He made experiments. Three steers, one nearly three years old, and the other two nearly two years old, were put on a ration calculated from the tables of the average composition of articles of fodder given in "Armsby's Manual of cattle Feeding," when we find the composition of such American grown fodders as have been carefully analyzed, and from Wolf's table of digestibility of fodder, the ration thus calculated as nearly as could be then estimated, the German maintenance ration, and consisted for 2,000 lbs. live weight, per day, of corn stalks, 14 2 lbs; clover hay, 3 8 lbs; cornmeal, 1 9 lbs; off malt sprouts, 84 lb. The whole ration for the three animals was weighed out together, the corn stalks being cut up, moistened and sprinkled with the meal and malt sprouts, and then divided, approximatively, in proportion to their relative weight, between the three animals. It was eaten up all but quite clean. The animals were weighed every morning after eating and before drinking. They were continued on this ration for six weeks beginning March 13th.

The average of the weighings of each successive week shows a steady though slight gain from week to week in the case of all the animals, and the average aggregate weight of the three was, for the first week, 2,535 lbs.; for the second, 2,571; for the third, 2,590; for the fourth, 2,633; for the fifth, 2,635, and for the sixth, 2,773—or per day on 1,000 lbs. live weight, 2 35 lbs. if we compare the first and last averages. Before the end of the feeding experiment, the fodder used was analyzed, and on calculation of the composition of the ration used on the basis of its actual composition, instead of the basis of average composition, it was found that, owing to the good quality of the corn stalks, which made up so large a part of the ration, the animals had been given daily 8 lbs. of digestible albuminoids instead of 7.5; and 8.03 of digestible non nitrogenous matters, instead of 8.25; and 17 6 lbs. of total dry substances, instead of 11.5; the nutritive ration was 1.10 instead of 1.12. The paper continued giving further particulars about other experiments equally successful.

## AGRICULTURAL LETTER.

PARIS, OCTOBER 7.

Mr Joulic, head chemist in one of the principal hospitals of this city, has been studying for several years the cultivation of wheat, with the view of diminishing its cost of production. He studies the plant in its various stages of vegetation, and studies the means best calculated to prevent the crop from being laid, and to ensure the ears to be well-filled with plump grain. The influence of the composition of the soil has been examined, not only when it is defective in certain elements, but when these elements even are present in excess. Farmyard manure, Mr Joulic considers to be a capricious fertilizer, in regard to its richness in nitrogen; wheat he says ought not to be cultivated on a soil directly treated with farm yard manure; (1) a root crop should intervene; to supply nitrogen to wheat culture, the assimilable nitrates or ammoniacal salts ought to be resorted to, the former for argillaceous and calcareous soils, the latter for light ones; superphosphate of lime is to be depended upon as a sheet anchor in wheat culture, and potash in case it be deficient. Expend at least 22 sous per 22 gallons of wheat raised, on mineral manures, and count upon the atmosphere somewhat for nitrogen, concludes Mr Joulic. His views have made a little noise, but they require to be steadied. It is an illusion to expect that a *pro rata* expenditure of 22 sous will equalize the mineral elements in the soil, for not only do these elements vary in point of utility following the nature of soils, but their commercial value is fluctuation itself. Farmers must not be led away by the siren theory, that to employ mineral manures will keep up the fertility of their land; let them purchase guanos, cake, farmyard manure, ammoniacal salts, while they will be able to obtain them. There is nothing to be disputed as to wheat succeeding a tillage crop, but it is absolutely gratuitous to lay down that the atmosphere supplies the nitrogen.

Professor Dehérain, of Grignon, finds after six years experiments on ordinary cultivated crops, that farm yard manure was superior to all others in respect to greater produce, and less exhaustion of the soil. The culture of sainfoin during three consecutive years led to an augmentation of nitrogenous matter in the arable soil, but this accumulation was not due to the plant absorbing nitrogen from the air, but to the exclusion of carbonic acid, which in the case of tillage, burns and destroys the organic substances in the surface soil. The same gentleman found in the case of oats, that the nature of the manure, but above all the season, can affect the richness of the grain in azote, to the extent of a double percentage.

Mr Dubsot has investigated the fluctuations in the price, production, and consumption of grain, during the last 60 years in France. Despite the increase of production and importations, one-fourth of the population of France, or 9 millions of people, have to depend on other cereals than wheat, for their daily bread. Thus France has a sufficient home market for her wheat. Relative to prices; these have not remained stationary, as is commonly supposed, but have augmented periodically, also, the elevation of price has been uniform, while remaining progressive, and in, addition, the entire country has benefited accordingly.

The population of France is 36 millions. each individual represents an annual consumption of grain, of 154 gallons, the produce in round figures of one acre of land; one-half, of the total of cereals raised is wheat, one-quarter, oats; the remainder, rye, barley, buckwheat and maize. The yield of grain varies in France, a  $\frac{1}{3}$ th above, or the same below the

(1) Wherefore, in Kent, Eng., we dung the young seeds.

normal quantity, yearly cultivated, but it is only in a fair average year, that the yield suffices for the wants of the population.

The average weight of 22 gallons of wheat, (a hectolitre), is 165 lbs; it can descend to 154 and mount to 180 lbs. The latter will produce about 156 lbs of first quality of flour. Flour absorbs 66 per cent of its weight of water; it parts with one-half of this quantity by evaporation when baked, so that bread contains about 33 per cent of water, almost the equivalent to the loss, in bran &c., which the wheat undergoes, during conversion into flour. I may remark here, that an agitation is on foot to replace the manufacture of bread by machinery, instead of the hands. In the South of France, the feet are employed in the kneading trough; now the bakers are almost naked when at work—similarly as the men in the wine vats, and in a perspiration, as they work close to the ovens and in cellars. A healthy man, during ordinary labor, parts with 2½ lbs. of perspiration per day, or about 1½ oz. per hour. Some of this is not pleasant to receive in one's hot morning roll. It is notorious fact, too, that the majority of bakers are consumptive. Another amelioration needed, is the use of the economic oven, so general in Holland and Belgium: it is heated either by hot air or steam, and effects an economy of 75 per cent in fuel.

Coagulated blood is an excellent manure, but its usage is limited; the blood of the slaughter house is rich in nitrogen and mineral matters, but as it decomposes rapidly, it is a dangerous and inconvenient fertilizer. A discovery recently made, enables the coagulating matter to be transformed into a solid, inodorous fertilizer. Fresh blood contains 28.20 of organic matter, and 0.80 of saline substances; the rest being water: dried, it is reduced to one fourth of its original weight; in this state it contains 12 to 18 p. c. of nitrogen and 1½ to 2 p. c. of phosphoric acid. Now sulphate of ammonia contains 20 per cent of nitrogen. The total number of animals annually slaughtered in France for food, is 43 millions, of which number, 1½ millions are oxen and bulls; 7 millions, cows; 1½ million calves; 26 millions sheep, and

the remainder pigs &c. The total of the blood of these animals amounts to 70,000 tons, valued at 300 fr. the ton. The total value of guano imported into France during the last years, was 50,000 tons, at an average price of 350 fr. per ton. In South America, where in some places upwards of 1000 animals are slaughtered daily, there is a grand future for applying the new discovery, and which consists in keeping the blood, when quitted the animal, constantly stirred with a stick to prevent the formation of clot, after which persulphate of iron is added: a kind of paste is then formed, very elastic, and which dries and forms cakes, to be ultimately pulverized. The product is inodorous; and contains from 10 to 15 per cent of azote. In the country districts, an ox yields about 4 gallons of blood, valued at 12 sous, which can manure 120 square yards, or the fortieth of an acre.

Mr Bouilliez—a name *à propos* to his process,—has adopted the following plan for preserving diseased potatoes; he erects immense boilers, in the fields even, cooks the tubers, and places them in trenches or silos, hermetically sealed: to wash, cook, and store the potatoes, represent an outlay of 9 fr. per ton. The cattle eat this preserve voraciously. Indeed it is becoming general now to store all root crops in silos, instead of in cellars: in the latter case, if destined for the market, there is a loss for the seller, if for consumption, for the owner, because potatoes &c, exposed even to the uniform temperature of a cellar, slowly ferment, and lose their nitrogenous matters. Professor Muntz has demonstrated, that all alimentary products undergo a sensible loss of their protein substances when exposed to the air, but that no less whatever takes place if the air be perfectly excluded. Distillery &c. grains are at present in great demand for silo preservation, and mix well with forage or roots similarly preserved.

A very useful implement has appeared; it is a bill-hook, serving at the same time for a hammer.

The cultivation of hops is on the increase, the consequence of deficient vintages: farm schools are henceforth to experiment in this new culture, as in Germany.

## How We Test Seeds.

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**BEWARE** of all imitations and of all other oil colors, for they are liable to become rancid and spoil the butter.

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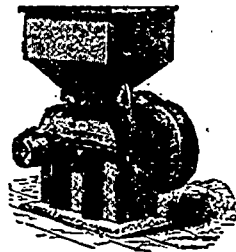
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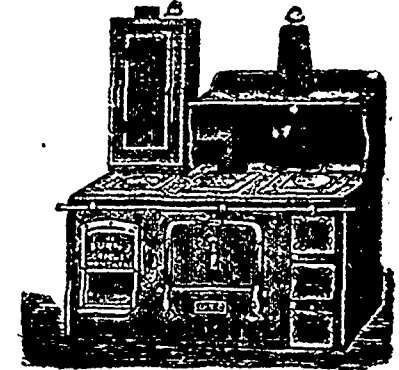
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