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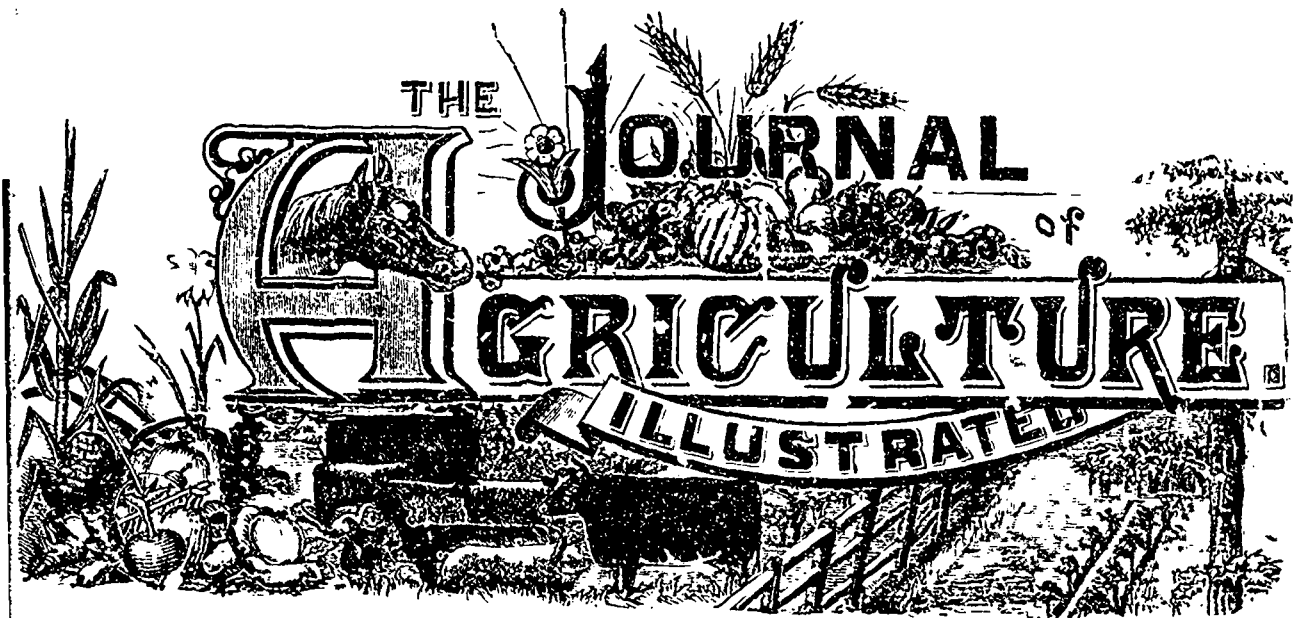
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Published for the Department of Agriculture for the Province of Quebec, (official part) by
EUSÈBE SENECAI & FILS, 20, St. Vincent St. Montreal.

Vol. XIV No. 3

MONTREAL, MARCH 1892 \$1.00 per annum, in advance

NOTICE.—The subscription to the *Illustrated Journal of Agriculture*, for members of Agricultural and Horticultural Societies, as well as of Farmers Clubs, in the province of Quebec, is 30c annually, provided such subscription be forwarded through the secretaries of such societies.—**EDITORIAL MATTER.** All editorial matter should be addressed to A. R. Jenner Fust, No. 4 Lincoln Avenue, Dorchester Street West, Montreal—or to Ed. A. Barnard, Director of the *Journals of Agriculture, &c.*, Quebec.

OFFICIAL PART.

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"The Ensilage and Economic Stock Feeding Association" will hold their Annual Convention at the Star Office Hall 165 St James St. Montreal, on Thursday 17 March. Several valuable papers will be read and discussed. Professor Robertson has promised to be present and address the meeting. **ALL FARMERS ARE CORDIALLY INVITED.** Mr. Chas. D. Tylee, of Ste. Therese, Province of Quebec, the Secy will be pleased to give any information required.

Official visit to Vermont and to the Dairymen's Associations.

Quebec, January 30th, 1892.

To THE HON. LOUIS BEAUBIEN

Commissioner of Agriculture.

Sir,—Having been entrusted by you with the duty of attending, first, the meeting of the Dairymen's Association of the district of Bedford, next, that of the State of Vermont,

Montmagny on the 27th and 28th of the present month, I have the honour to make the following report :

That the syndicate of the united factories of the and, finally, that of our own provincial association, held at

DISTRICT OF BEDFORD

organised at most eighteen months ago, has succeeded in a manner that surpasses our highest expectations. It was found to be expedient last year to establish a second syndicate. The two together have so improved the cheese made at from 50 to 60 factories, that it obtained the GRAND PRIZE at the last Dominion Exhibition, held at Sherbrooke, in competition with the best cheese sent thither from the different provinces of Canada. The Judges were Mr. Robertson, Commissioner of the Dairy-Industry, who is attached to the experimental farm at Ottawa, aided by one of the principal buyers of Great Britain, who happened to be in Canada on a visit of inspection. The judges, therefore, could not but be well selected and perfectly disinterested. The cheese was thought to be of so superior a quality, that it was sent to England and Scotland, to the local exhibitions, and to the best known importing firms. The Commissioner of the Dominion Dairy-Industry telegraphed to us at Montmagny, that the cheese of the Bedford district had met with the greatest success, has been considered one of the best samples of cheese hitherto exported to England, and was sold in England at the highest market price.

The meeting at Cowansville, at which you yourself, Mr. Commissioner, were present, lasted two days. The sessions, of which there were six, were most attentively followed up, and in the evening, deep into the night, numerous groups of farmers and other interested persons continued the discussions in the hotels, and detained the weary specialists on their road

home, in order to extract from them the greatest possible amount of information.

VISIT TO THE STATE OF VERMONT.—I stopped first at Newport, for the special purpose of meeting a veteran agricultural journalist, highly appreciated in this province, Dr. T. H. Hoskins, of the *Vermont Watchman*, the chief authority on those

FRUITS OF NORTHERN CLIMES.

that are suited to the coldest and to the most exposed parts of America. The much regretted Charles Gibb, of Abbotsford, who sacrificed both fortune and life in perilous journeyings in Russia, both European and Asiatic, and as far as New Zealand, advised me, twenty-three years ago, to apply to Dr. Hoskins, he having been his first instructor as regards the fruits best suited to the climate of our province. Dr. Hoskins has for many years taken a very active part in the most useful work of our provincial Horticultural association, the seat of which is at Montreal.

DOES FARMING PAY? At least a partial solution of a hardily contested question here presents itself: does farming pay? Dr. Hoskins has answered this question very clearly, at least as far as he himself is concerned. I think it would be well to give here, in a few words, his positive demonstration of the problem. Brought up in the country, endowed with the most emphatic aptitudes for the study of the exact sciences, he devoted himself to horticulture from his childhood, attending to school at the same time. Later, his success in market-gardening and fruit-growing enabled him to treat himself to a university education, without at the same time neglecting his gardening operations, the sole source of his income. Indefatigable in his studies, his masters led him on to the attainment of the highest steps of the scholar's ladder. He obtained exceptional university honours, and was induced by his teachers to devote himself exclusively to the practice of medicine at Boston, the metropolis of the New-England States. There, he was already winning distinction as a skilful physician, when, in consequence of a fall, he nearly lost his life, and was in danger of becoming a permanent cripple. His only chance of even partially recovering his health was to leave the town, and to seek in the country the partial re-establishment of his health. At last he took up his abode, in a modest seclusion, on a small piece of land, and without any funds to start with. He had to carry out, himself, the fruit of his daily labour to his new customers. To-day, his gardens and orchards are extensive, and his reputation as a trustworthy authority is universally recognised. Besides growing fruit, he follows general agriculture, especially the dairy-business, with distinguished success. A man of scientific attainments, a physician in great practice, he left the town for the country, his health weak, his limbs feeble, and all his little property expended during his long and painful sickness, and, yet, by his own sole work, work, though, of an intelligent and persevering kind, in spite of the failure of his bodily strength, he lives at ease, exclusively from the produce of his fruit and his agricultural labours. Therefore, farming pays, at least it pays those who conduct it with knowledge and prudence.

BURLINGTON DAIRY SCHOOL, VERMONT.—I recently visited the greatest butter-factory in the whole world, at St-Albans, Vt. As much as 10,000 lbs. of butter has been made there in one day during the first year of its existence, and the factory is so arranged that 20,000 lbs. of butter can be turned out easily in a day. It is, so to speak, fed by 50 centrifugal separators, placed at a radius of some leagues from the central factory, and the milk and cream are brought thither either in special vehicles, or by the numerous railroads that meet in St-Albans. This enormous enterprise, managed, practically, by Mr. Palmer, formerly of Danville, Q., and therefore a

Canadian, with satisfactory success from its inception, has created so much interest, that the State authorities thought fit to establish, last December, a

SPECIAL BUTTER SCHOOL.

in connection with the University, the farm-school, the experimental station &c., all official organisations of the State, united at Burlington. Having been informed of this by Mr. Palmer himself, at an exhaustive visit paid to his magnificent establishment, I put myself into communication with Prof. Cooke, director of the farm-school. The faculty of agriculture, with a readiness for which we cannot be too grateful, agreed to give, gratuitously, theoretical and practical instruction to seven or eight of our best butter-makers, during the whole of the course, which lasts four weeks. Eight pupils attended the course which ended November 30th. During my journeys, backwards and forwards to Brattleboro, I was lucky enough to travel with Prof. Cooke, director of this school, and Mr. Clark, professor of applied chemistry, &c. Both these gentlemen, in the name of the professors of the school, praised our pupils most highly, assuring me that the English-speaking ones are now thoroughly capable of conducting any similar school that may in the future be established in this province. These pupils, then, are fitted to deliver useful lectures in all that concerns the making of butter; they can, moreover, show how to detect frauds in the milk delivered at the factories; and, lastly, they can speak with thorough knowledge of the treatment of milk-cows, as they have seen it practised at the extensive cow-sheds attached to the Burlington agricultural school. The members of the dairymen's association had lately, at Montmagny, an opportunity of applauding one of these pupils, M. Aimé Lord, teacher of butter-making at the L'Assomption school. M. Lord showed us, in a striking and intelligent manner, the utility of

THE BABCOCK TEST,

a small, cheap instrument, which enables one to pay for the milk according to its exact contents of butter, and also when the milk is used for making cheese, prevents all fraud by a few moments of investigation, and, lastly, may be made very useful even in the cow-stables of the ordinary farmer by showing him the comparative value of each of his cows as regards its yield of butter-fat.

FARM-BUILDINGS.—One of the chief reasons of my journey to Brattleboro, and generally to the state of Vermont, was to study, on the spot, the best farm-buildings, barns, cow-sheds, dung-pits &c. &c., in connection with the dairy industry. Dr. Hoskins, who, in his paper, has, during the last year or two, published a series of special articles on this question, had frequently pressed me to assist him in this matter of such great economical importance, especially now, when the dairy-industry is everywhere becoming so developed. We, therefore, Dr. Hoskins and I, studied at length the series of articles I had the honour to publish recently in the *Journal of Agriculture*.

In order to add to the fruitfulness of this investigation, I had made, with the kind permission of M. Joly de Lotbinière, president of the Council of Agriculture, an exact model, scale $\frac{1}{2}$ inch to the foot, of a building the plans of which I have given in part, and which was erected a short time ago on the farm of the RR. DD. of the Sacred Heart at Lorette. This model, though, contains an important improvement, which, combined with a considerable saving in the cost of the building, admits of much greater facility in storing the fodder, and of its distribution to the cattle. The principles aimed at and applied, are, to the best of my knowledge, the following:

1. Strict economy in the whole and in the details;
2. The proper conditions to ensure, first, the health of the animals; ample light, enough warmth; complete ventilation, without

draughts; constant cleanliness, night and day; 3. Facility of preparing the food, so as to render it as digestible as possible, and to feed the cattle with as much profit and as little labour as possible; 4. Pure water, sufficiently tepid, and always within reach of the cattle;

5. A thorough preservation of the liquid and solid excrements up to the time when they can be applied, without appreciable loss, to the wants of plants.

6. Model silos, and storage roomy, convenient and economical for all the fodder-crops grown on the farm.

I am far from asserting that we have arrived at perfection, but perfection is not to be secured in this world. Still, I have the satisfaction of stating that the Dairymen's Association of the State of Vermont thought fit to submit this model to the judgment of competent specialists, who have made a report on it couched in the most laudatory terms. Unfortunately, the promised copy has not yet reached me, but I hope to annex it to this report. Moreover, the professors of the Vermont school of agriculture have been obliging enough to declare that their own farm-buildings, recently erected, after the most approved plans, contain nothing better; and, if I understood them aright, they added, that our system of ventilation is superior to theirs.

THE DAIRYMEN'S ASSOCIATION OF THE STATE OF VERMONT.—The annual meeting of the members of this society took place this year at Brattleboro, a rural town of considerable size, where an audience of from 800 to 1,000 persons were comfortably accommodated in a spacious, well lighted, and well warmed hall. In another large apartment, were exhibited in operation the apparatus of the dairy and the cheese-factory, steam-engines, separators of all kinds, centrifugal and other butter-workers, all put in motion by steam or by hand. There, I saw in operation, besides the most improved centrifugal separators, one of those curious and most novel of machines that, in at most a few minutes, produced choice butter immediately after the milk was drawn from the cow. On this point, I may say that the specialists declared that this revolution in the method of extracting the butter from the milk, will soon become generally applied in dairy-practice.

In the same apartment, there was a fine exhibition of dairy-products. Every year, the society opens a special competition in connection with the annual meeting, and gives numerous prizes, which has the effect of inducing many ladies and others interested to visit the convention. I particularly commend these exhibitions of products and special apparatus, in connection with the annual *Conventions*, to the attention of our dairymen's associations, both provincial and district. They are calculated to double the number of those interested in our *Conventions*.

Of all the States of the Union, Vermont manufactures the greatest quantity of butter, and its quality is such as to obtain for it the highest reputation on the New-England markets. It was very pleasant to see here the number of educated men, of men noteworthy in the State: ex-governors, senators, statesmen, engineers, and *savans*, who are making a speciality of the dairy industry. Among the audience, I observed several hundred ladies, many of whom were taking copious notes, and appeared to be most interested listeners. I draw attention to this, for as soon as the mother of the family becomes acquainted with what agriculture, in one or other of its branches, is capable of doing to improve the resources of the family, emulation and intelligence do their part for each of its members, and shortly these industrious families become the most thriving among the society of farmers.

I was delighted to see the deep interest manifested by the leading papers of the United States in the *conventions* of the Dairymen's Association. There, I met the editors of eight or nine of these papers, some from Ohio, some from Wisconsin,

as well as others from the New-England States. I need not say that the highest authorities of the States as regards the dairy-industry, such as, Ex-Governor Hoard, the Hon. Messrs. Gould, of Ohio, T. D. Curtis, of New-Hampshire, Peters, Black, and Bowker, of Massachusetts, Dastan Smith, of the Department of agriculture, at Washington, were among the most appreciated speakers. I cannot enumerate all the distinguished men of Vermont, the ex-governors, the senators, the presidents of the legislative assembly, &c., &c., who spoke on the dairy industry. Let it be enough to note the fact that, during three days, we had three sessions a day; that not an instant was lost, and, had it not been for the charming music we were treated to, at regular intervals in the afternoons and evenings, it would have been hard work to devote all the requisite attention to the numerous important subjects that were discussed.

The organisation of this society is almost the same as our own, with this difference, that it has to keep up its meetings for three consecutive days; that its sessions must be held in places large enough to ensure that the meeting-halls and exhibition-building, the hotels, the roads &c., be suitable to the intended purpose; and, lastly, that steps be taken to press all the farmers of the neighbourhood to be present at the sessions, and that there be sufficient room to accommodate the whole audience comfortably.

CONCLUSIONS.—This report is already very long. There still remains, however, much to be said of the so precious instruction to be derived from this my visit. I took such notes as will be sufficient to enable me to treat the most important subjects in the *Journal of Agriculture*, but, permit me, Mr. Commissioner, to say a few words about the impressions made upon me during so a fruitful journey, one that will certainly have the effect of facilitating my arduous task as the director of the *Official Journal of Agriculture*. The following is a résumé of my conclusions:

(1) Our local advantages, our climate, our habits of work, the superiority of our milk-breeds and of our pastures, our water, and even our cold, which ensures the preservation of our products while awaiting exportation; all these advantages, as well as others we possess, tend to make our province that part of North America in which the dairy-industry should flourish and develop the most.

(2) Our Dairymen's Association, which has already completely transformed that business in this province, after having, so to speak, created it, can help us more and more extensively: By the formation of as many additional

SYNDICATES

as possible, in which shall be studied the production of the very finest butter and cheese, and in which the patrons shall be taught to produce the greatest quantity of milk at the least possible cost. Ten district-syndicates have been created this year. They represent about 225 syndicated factories. Already, the increase of value obtained by the products of these syndicates represents an altogether extraordinary sum of money.

For, these syndicated-factories have sold 410,000 lbs. of butter at 20½ cts., and 13,000,000 lbs. of cheese, amounting to \$1,700,000, in the first year of their establishment. The excess obtained by the improvement caused by the syndicates in the manufacture of the products cannot be put, at the lowest, at less than \$50,000! Now we have, in this province, 660 cheeseries and 146 creameries. There are, then, only ⅓ of the cheeseries and ⅓ of the creameries syndicated; there could be, then, half a million dollars gained annually, from this very year, if all our factories were equally well managed.

But, to enable these syndicates to gain their end, we must ensure a supply of intelligent makers, well taught men, honest, and as competent as possible; out of which body we may

select the most skilful to convert into factory inspectors, and, I hope, into lecturers. These men, both inspectors of factories and general inspectors, should be kept well abreast of the best practices based on science, in order to spread to their best ability the teachings that flow from the two—practice and science—whether in the course of their visits of inspection, or in regularly organised lectures.

I have the pleasure to inform you that

THE LAST MEETING OF THE DAIRYMEN'S ASSOCIATION,
AT MONTMAGNY,

the members were greatly occupied in considering how to give a powerful aid to instruction by means of farmers' clubs, agricultural societies, &c., &c. A committee, composed of energetic men, selected exclusively from either the officers of the association or from the officers of the agricultural societies or other bodies of the same kind, was entrusted with the duty of studying and putting into execution a projected union of farmers of the province, which would furnish us with a society, identical, in its issue and operations, with the association of the *Agriculteurs de France*, and the numerous local syndicates that derive from it.

The increasing interest taken in the annual meetings of the Dairymen's Association, and the always augmenting numbers of those interested in it who attend those meetings, will render it necessary, before long, to establish similar conventions in the principal districts of the province. Besides, it is this that the sister province of Ontario so well understood, when she founded her

FARMERS' INSTITUTES

or conventions of agriculturists, which multiply year after year, and bring thousands of persons every year, in all parts of the country, into contact with specialists the most distinguished in the different branches of agriculture.

I have the honour to be,

Sir,

Your obedient, humble servant

(From the French) (Signed) ED. A. BARNARD.

Secretary of the Council of Agriculture and
Director of the *Illustrated Journals of Agriculture*.

Quebec, Feb. 5th, 1892.

Madame,—I have received your interesting and obliging letter, with the plan of your farm contained and explained therein. Since then, I have had to take several trips, one of which was to the United-States. However, I have studied, as well as I could, the situation of your agricultural prospects, and I offer you, in the mean time, until I can do better, the following statement of the things that seem to me to be worthy of being the most maturely considered with a view to the future.

Your community, if I am not deceived, requires the use of a great quantity of milk. This is the most complete form of food given by the Almighty for the good of all animals, especially during the period of their growth. If our young people in the colleges and convents could manage to live principally on milk-foods, &c., constitutional weaknesses of all kinds, which we see especially among the most brilliant scholars, would be far less frequent. To the different preparations of milk, add plenty of vegetables, and you will have, or rather your farm will produce, the greater part of the food consumed by your community.

This is, in a modest way, the opinion of an amateur (*pékin*) on a professional subject; (1) it must be taken for what it is worth.

(1) French soldiers used to call civilians *pékings*, i. e. wearers of the yellow cotton-stuff, made in China, that the English used to call, and perhaps still, *Nankin*.
A. R. J. F.

Taking it for granted that you wish to produce milk, butter, and cheese,—the last of which can be made very advantageously with a cheap apparatus, described and illustrated in the *Journal*, after a practical skimming of your milk, which is too rich to be largely used in its natural state—I should prepare all my crops to further that end.

Now, here, I am about to attack a delicate subject: 1st. How much pasture do you need at the very least? Granting that you have at most 35 arpents under cultivation; granting that a considerable portion of the milk your cows yield will be used for the different wants of the community, I should abolish pasturage altogether. Therein lies the great secret of the agricultural success of the R.R. D.D. of the S. C. at Quebec. They have not quite 30 arpents of land, and the soil is very difficult to work. There is hardly an arpent of it of really superior quality, and the whole had to be drained at a great expense. Still, without any land in pasture, they keep an average stock of 26 cattle. It is true that they have not hay enough to carry their herd through the winter, and that they have to buy some, as well as some meal, on the market. You, then, must do differently on your farm as regards your system of farm-management, since I hope that you will grow quite sufficient for your own wants, without having to buy anything, or at any rate as little as possible.

Second: How will you provide the food for your herd? Answer: Last fall, you ploughed and cleared off the stones from fields 8 and 9, situated close to the stable, and these, with the *gore* (*lisière*) No 14, give you about six arpents to sow. But, to ensure success, these fields must be thoroughly ditched. Pray do not neglect this work of water-furrowing. Your future success in this field depends chiefly on its being completely put in order and the hoped for milk must come from this field.

The present ditch must be cleaned out as well as possible, be properly widened, the sides pared, and, lastly, it must be deepened as low as the level of the highest rise of the water from the lake, so that the highest part of this field may be worked in early spring. As to the low-lying part of the same field on to which the water of the lake rises, I see no other means of cultivating it, if it be possible to cultivate it at all, than by cleaning out the ditch to the bottom every year as the water falls back from it into the lake. This, however, is a matter of local investigation which I had not time to make during the by far too hasty visit I paid you.

On this point, I beg you will give me some information as to the extent of land that suffers from spring-floods, and the approximate dates at which, on an average of seasons, the water subsides two feet, at least, from the surface of the land in question.

If the fields 8, 9, 11, and 14, containing in all about 7 arpents, were sufficiently drained, you could grow on them, quite close to your cow stalls, enough food for at least 7 head of cattle throughout the year; for the soil is excellent, easy to work, and you have at hand the necessary materials for its perfect manuring. This is the treatment I advise: As soon as the land is fit in the spring, sow, on the fall-furrow, on one arpent a mixture of 2 bushels of oats and 1 bushel of tares and pease, mixed half-and-half, with 12 pounds of clover, half common red and half alsyke. (To cover the pease and tares properly, you will sometimes be obliged to plough them in with a shallow furrow of, say, 3 inches: in which case you must harrow the autumn-furrow first, then sow the pease oats and tares, plough them in, and harrow again. After this is done, you will sow the clover, harrow, and later, pass the roller over the piece as a finish.)

Do not forget that the roller must only be used when the soil is fairly dry, and that it should be heavily weighted with stones or other materials.

This being completed, six weeks after sowing the green-crop on this field will be 14 or 15 inches high, D V.—and this food will, with a sprinkling of salt, make your cows give more milk than the finest pasture. The cows will be kept in the stable, with windows and doors wide open, of course; and I advise you to take away the boards of the flooring of the loft above the cow-stalls, along the side-walls, for about 3 feet in width and, for the full length of the cowshed. Later, I will tell you what must be done with this when the time for refilling the hay-loft arrives. Lastly, insert on the outside of the top of the cowhouse loft a ventilator about two feet square, with roof and louvres so that the hot air of the cowhouse may escape constantly through this opening. Thus, your cows, in such a well ventilated chamber, will be more comfortable than they would be in the open air.

There remains the very important question, how to maintain perfect cleanliness. Near the cowhouse, you have plenty of bog earth. As soon as the summer comes, you had better have some loads of it, from the upper and drier layers of the field, laid down close to the cowhouse, in some sheltered place, either in the barn or in a shed, or even in the hay-loft, and this last would be by far the best place, if you could manage to store your bog-earth in it without too much labour. Your cows lie on a very short space of flooring, and behind them is a passage (*allée*) deep enough to prevent the dung from touching them when they are reposing on the flooring of the stalls. This is all right. All that will be necessary is to clean out the dung three times a day, and to sprinkle a little dry bog earth over the flooring to dry up the moisture. This will be enough to ensure a complete fulfilment of hygienic conditions.

A few handfuls of plaster—two for each cow daily—will purify your cowhouse admirably, and will increase the value of your manure two or three times the cost of the plaster. The plaster is to be spread over the newly scattered bog-earth.

As for the green-meat, the cows are to have as much of it given to them as they will eat up clean; and so with the horses, the pigs, and all other animals that are kept within easy reach of it. Give them plenty of it, without fear; but always remove at once from the cribs and mangers all that is not consumed after the cattle have finished their meal.

With reference to what is to be done with the calves, heifers, and ewes, in your possession, I strongly advise you to hire for them some good pasture from a careful farmer at some distance from your place. This will cost you much less than feeding them at home, during summer, on your little bit of land.

I hardly think that the equivalent of the eight head of cattle you have to keep would consume more than half an acre of the above green-meat during the proper time, that is, before the crop goes down. This must not be allowed to take place, for the green-crop in question would lose the best part of its value if it were to go down. (1) It would rot from the roots upwards, &c., very quickly. If your land is as rich as I take it to be, half an arpent will be enough to sow for green-meat, and this should be all out and carried within 8 or 9 weeks from the time of sowing. Besides this, there will be the clover in the small pieces, No 7, to reckon on. By the 10th June, this ought to be ready for the cattle, that is, as soon as the scythe can cut it without too much work, beginning with the parts where the crop is heaviest. Variety of food is one of the most useful of all things in cattle-feeding. You will then mow and mix with the green-meat a little clover, and later, even some of the older meadow grass, the sides of the ditches, &c. A second cut will be ready almost as soon as the first is finished, especially if you began the first-cut when

the plant was pretty young. You will have enough of it for the whole season, particularly if you spread a little fresh manure over the meadows or grasses immediately after they are mown.

During the summer season, these dressings of manure ought to be spread during cloudy or even rainy weather. Ten one-horse loads of fresh manure will do for an arpent.

You will then have sown for green-meat from half an arpent to an arpent of the fields 8, 9, 14 or 11, according to the richness of the soil. Get ready three more arpents to sow with the best Canadian maize. A bushel of seed will suffice. Dr. Bruneau, of Sorel, will doubtless be happy to get you selected seed, if you let him know without delay.

As to the rest of those small pieces, I should sow them in oats and clover, if the deepening of the ditch be made early enough; but only in clover, and the natural grasses best fitted to your wet soil, in those spots from which the water falls back too late to allow grain to ripen. (In the latter case, you should sow, after thorough ploughing and harrowing, and bury the seed by a last stroke of the harrows, followed by a heavy roller.) In this way, you can arrange matters for the future, so as to cultivate each year the six or seven arpents in question, in the following rotation:

- 1 arpent in green-crop, with clover-seed;
- 3 arpents in Canadian maize;
- 2 arpents in permanent grass, if the water will not allow other crops to be grown;
- 1 to 2 arpents in beans.

Adding to this the green-meat to be cut, if wanted, from the small pieces, No. 7, you will have more silage than the silo will hold, and enough green-meat to abundantly supply all your cattle during the summer. I am convinced that the pieces, No. 7, containing about $2\frac{1}{2}$ arpents, added to the six arpents mentioned above, would eventually feed all your cattle during the whole year, provided that $1\frac{1}{2}$ arpent were devoted to the growth of those beans that succeed best with you.

Here, I stop, for to-day, my enquiries into the question of what you can realise on your little farm with the trifling resources at your command. I need not say that the amount of labour required will be necessarily increased, but there will also certainly be a still more notable increase in the net profits to be derived, almost daily, from the dairy-industry carried on with an especial view to the more healthful and much more economical dieting of your community.

For the rest of my work, I shall wait for your observations on what I have already said. I trust you will give them to me in their entirety and without the slightest hesitation. We are both working, in proportion to our several powers, to elucidate an economical problem which seems to me to be of very great importance to the farmer in general, but especially so to those educational establishments, &c., that, situated in the country, are in a position to carry on, for their own benefit, a more or less important agricultural exploitation.

Believe me to be

Your most devoted servant,
(Signed) ED. A. BARNARD.
Sec. Council of Agriculture and
Director of the *Journals of Agriculture*.

P. S.—The farm, of which I have been speaking, is new and full of natural fertility. I have reason to hope that the phosphoric acid carried off in the milk, will still be to be found in superabundant quantities in the soil after several years. For older soils, there will be needed a dressing of 300 lbs. of superphosphate, costing about \$1.25 per 100 lbs. about every three years, to prevent the impoverishment of the land and the consequent diminution of the yield. But if people, especially in the country, knew how to avail them-

(1) Besides, perhaps, destroying the clover plant. A. R. J. F.

selves of all the human excrements, and to mix them, proportionally, with dried bog-earth and a little plaster, they would have, with very little trouble, a source of fertility abundantly sufficient to manure about 3 arpents of land for every 100 persons. This calculation presupposes that nothing is wasted, and it is also presupposed that measures be taken, measures perfectly simple, that there be no unpleasantness whatever incurred in the collection and distribution of the matters in question.

As regards growing the beans required for the production of the greatest possible yield of rich milk, that is, about 7,500 lbs. a year, on an average, from each cow—equal to two gallons imperial from each cow daily—about 3 lbs. of beans a day must be given to each cow either ground or made into soup. The quantity of beans necessary for the daily ration of each cow for a year, can be easily grown on a quarter of an arpent of land, if it be well cultivated.

(From the French.)

Paper read by W. Penney, at a meeting of the Farmers' and Gardeners' Club of Quebec on the 11th February 1892.

At the last regular meeting of this Club when Mr. Arnott read his very instructive and interesting paper on the soil, he invited discussion on the same subject, and as very little followed, if it is not out of order, I should like to give some quotations from authorities on the same subject. Mr. Arnott divides (if I remember right) the soil into four parts namely clay, sand, lime, and magnesia. Now, the derivation and condition of these substances as well as their value is well described in Thompson's Gardener's Assistant, and I will proceed to read a few extracts therefrom, knowing that the information taken from that work is unquestionable.

"On examining soil more minutely, it is found that it is composed of essentially the same elements as those which form the more solid parts of the crust of the globe. The mineral bases from which the greater bulk of this is formed are not numerous: they consist of silica, alumina, and calcium or lime. These bases are only found pure in small quantities and are separated with difficulty; yet, when united with oxygen it is estimated that they form more than half of the crust of the terrestrial globe.

Although the same substances as are found in the soil are to be found in the rocks, it is not to be supposed that the latter could be formed from the soil, whereas there is every probability that soil has been derived from the rocks. The primary rocks, the most constant of any in their character, yield soils of very different properties under the different conditions to which they may be subjected. Thus, the rocks which in the mountains of Argyleshire are so barren, yield in the Channel islands a soil of great fertility, and in Normandy, the finest soils of the department are derived from the primary and transition rocks. The *old red sandstone* presents soils varying from the most barren to the most fertile, and nearly all are capable of improvement. The nature of rocks, being so intimately connected with that of the soil, it is certainly "worth while to give some attention to them and the elements which enter into their composition, for, knowing this, it is much easier to comprehend how cultivated soil can be derived from them." In "a table of the elementary composition of various rocks, as recently determined by eminent analysts," rocks are divided into 17 varieties, and from these all kinds of organic (1) soils are formed in more or less quantities of each or any. It shows that rocks are chiefly composed of silica, alumina, the alkalies potash and soda, magnesia and lime. These form the earthy bases which consti-

tute the bulk of rocks. Lime, with carbonic acid, forms limestone, marble, &c., and with sulphuric acid, gypsum, in addition to these, sometimes occur the oxides of iron and of manganese, with a little fluoric acid, and phosphoric acid, the latter of which is very important, but its quantity in rocks is difficult to ascertain exactly, owing to its being so volatile and inflammable.

The enumeration of the substances found in rocks may also stand for that of the inorganic elements of which soils are composed, and these elements are likewise found in plants. Silica is the most widely diffused substance of which rocks and soils are formed. Either pure, or combined as an acid with metallic bases, silica has been estimated to form almost one half of the solid crust of the globe. Granite usually consists of three ingredients—quartz, felspar, and mica, or quartz, felspar, and hornblende. These on analysis have given: quartz, silica 100 %.

Felspar, silica 62 to 65, alumina 17 to 18, potash 13 to 16, lime 3, and oxide of iron 1 %. Mica: the composition of this varies considerably according to the variety, containing from 40 to 47 % of silica, and from 13 to 31 % of alumina, with oxide of iron and potash.

Hornblende consists of silica 42 to 54 %, alumina 14 or 15, lime, magnesia, and oxide of iron, in proportions varying according as it is basaltic or syenitic. It will be observed that in all these compositions silica forms by far the greatest percentage. Hard and compact as these rocks are they are capable of disintegration to form soils as will appear from the following: Quartz is not a silicate, but pure silicic acid; carbonic acid cannot, therefore, act upon quartz so as to cause its disintegration. Mica consists of silicate of alumina, persilicate of iron, and silicate of potash. Carbonic acid, being capable of combining with the potash, decomposes the latter salt, forming with its potash carbonate of potash, and liberating silicic acid. This decomposition of one of its constituents is, of course, attended with the disintegration of the mica. Lastly, felspar is a double salt, composed of silicate of alumina and silicate of potash. This ingredient of the granite, is far more readily disintegrated than mica; it separates into silicate of alumina, persilicic acid, and carbonate of potash. The two latter substances dissolve in, and are carried away by, water, while the silicate of alumina remains undissolved, and, according to its degree of purity, receives the name of common clay or porcelain clay." The foregoing shows how inorganic soils are formed and are continually forming, as the rocks are exposed to the action of the elements. Before going into the classification of soils we will see how organic soils are formed. "The organic portions of the soil are of course subsequent acquisitions to the inorganic constituents, in as much as the former are derived from the decay of plants and animals, and as the decay of these could not precede their existence, they must have lived originally on soils destitute of organic remains.

Decayed vegetable matter assumes a dark brown or black colour, and is termed humus or mould. This is formed by the gradual decay of animal and vegetable matter, under the influence of water, air and heat. Liebig defines it as a woody fibre in a state of decay, and states that it is formed by the oxygen of the air slowly uniting with woody fibre.

Classification of soils.—From what has been stated it will appear that the inorganic bases of soils consist of substances derived from various kinds of rocks. The bulk of these substances consist of *silica, clay and lime*. Being mechanically mixed in no definite proportion, these, together with organic remains, *humus*, afford an infinite diversity of soils, independently of the few or many saline matters which they may also contain in greater or less quantity. As the varieties of soils are so numerous, and merge one into the other, posses-

(1) This is explained subsequently.

ing no natural lines of demarcation, it is evident that some system of classification must be adopted in order that we may know with sufficient clearness and exactness, what is meant by the term used to designate any particular variety of soil. Accordingly, many systems of classification have been proposed, but the following one appears to be the most complete, and would, if generally adopted, prevent in a great measure the confusion which so frequently arises from the indefinite use of the terms sandy, clayey, calcareous, &c., as applied to soils; and also that of local terms, to which different meanings are attached in different parts of the country. This system is founded on the principle that soils generally consist of a mixture of clay, lime, humus, and silica, as above stated; and the divisions and subdivisions are formed according to the proportions in which the above constituents are found. Various examples of soils distinguished for remarkable peculiarities in different countries are given. It is presumed that, on the whole, a practically useful idea of the nature of soils will be afforded which may lead to their great improvement."

The classification that follows is too long to give in detail here, but I will try to condense it, as it may be of interest to some. Schübler divides the soil into 8 classes, and subdivides them, each, into from 3 to 15 divisions, all of which contain only clay, lime, humus and sand.

"1st. Argillaceous soils, commonly called clay soils, contain above 50% of clay, and not more than 5% of lime. Before treating of this class of soils it will be necessary to explain what is meant by the term clay.

This substance is a combination of silica with alumina, the proportions of which vary in different sorts of clay; thus, in one clay there may be 40% of alumina the remaining 60% being silica together with some other substances; whilst in another sort of clay there may be only 30% of alumina and nearly 70% of silica. Clay is chiefly characterised by its plasticity and softness to the touch. According to Schübler, pure clay does not effervesce with acids; diffuses when breathed upon in a dry state, a strong earthy odour; adheres to the tongue; quickly absorbs water, oils, and fatty substances; it remains, for a certain time, lightly suspended in water, which it renders muddy, but from which it perfectly separates again, by subsidence, when at rest. Of this water it retains, in its finer state, from 70 to 71 per cent, without allowing it to drop away from it. In a compact and moderately moistened state, water penetrates but slowly into its interstices; it dries up slowly, and in so doing shrinks into a smaller space, leaving many cracks and fissures throughout its substance; it readily takes up humus and humic acid in considerable quantities; these seem to combine with it, partly in a chemical manner, and partly in a physical one; in consequence of which it remains for a long time fertile, after it has once been properly penetrated by humus particles and other earths, which communicate to it the requisite lightness for cultivation.

Besides the above constituents, various other substances occur incidentally in clay. These principally consist of oxide of iron, sand, free silica, and often of lime, magnesia, oxide of manganese, potash, and soda. Clay which has been dried in the sun, always contains a certain amount of combined water, varying from 5 to 15%, and which can only be driven off at a red heat. The colours which the varieties of clay assume are generally owing to the presence of iron in different states of oxidation. Thus, the brown colour results from the protoxide of iron, the red from the peroxide, and the greenish and blue from the hydrated protoxide. Clay soils are unfitted for the generality of garden operations till improved by draining, liming, trenching, long dung, ashes, or sand.

When so improved, if rendered sufficiently porous, they be-

come very productive, and are not liable to be so soon exhausted as other kinds of soils.

2. Loamy soils—these contain not more than 50 nor less than 30% of clay: of lime and humus there may be less, but not more than 5 per cent of each, and the remainder is sand and other matters.

These above would constitute a strong loam which when properly cultivated would make a good garden soil.

3. Sandy loams—these contain not more than 30 or less than 20% of clay, and not more than 5% of lime or of humus. This is a variety of soil that is well suited to grow good crops and is at the same time more easily cultivated than strong loam. They are also earlier, as they are not so retentive of moisture, and are capable of being (from that cause) more easily heated in the spring. At the same time they have enough clay in them to retain sufficient moisture to prevent them from drying out in spells of hot weather as very sandy soils do.

4. Loamy sands—contain not more than 20 or less than 10% of clay and not more than 5% of lime or of humus. They are too light for fruit trees, although when deep and on a good subsoil they may be made to succeed by adding compost, and by taking care that the roots are duly supplied with water. These soils are desirable for early crops; potatoes, carrots and turnips succeed well in them.

5. Sandy soils.—These contain at least 80% of silicious sand. They differ in colour according to the quantity of oxide of iron they contain. When they consist of sand or gravel (*alone?*) they are extremely barren, but with as much as 3 to 5% of humus they are very suitable for the growth of some crops. By the addition of clay or marl, soils of this nature are rendered more compact, thus retaining moisture and the more valuable parts of manure, that is, the parts that wash out, and that pure sand or gravel will not absorb the same as clay will.

6. Marly soils.—Not more than 20 or less than 5% of lime. According as they partake of the nature of other soils they are termed clay marls, loamy marls, and sandy marls. They are intermediate between calcareous and clay soils, and, while not so retentive of moisture as the latter, they are not so porous as the generality of the former. Clay marls containing more than 50% of clay are too stiff for gardens. Loamy marl, if rich in humus, is an excellent soil, suitable for fruit trees, and capable of bearing heavy crops. Sandy marls are good for early crops, especially if darkened in colour by humus.

7. Calcareous soils—These contain more than 20% of lime, and according to the amount of sand or clay which they contain, they are called calcareous sands, calcareous loams and calcareous clays. These soils vary much in their fertility and productiveness, and where they are light coloured, are not so suitable for early crops. This defect can be remedied by the addition of such soils and manures as tend to darken them; but, on the other hand, if they are not so easily heated as dark soils, they retain their heat longer, as heat is radiated faster from a dark than from a light substance.

8. Humus soils or vegetable moulds.—All soils containing more than 5% of humus, no matter what their other composition may be, are termed vegetable moulds. From this it results, that soils of very opposite natures are comprised in this class to which the rich and productive garden-moulds and the poor and barren peat or bog alike belong. Vegetable moulds are called clayey, loamy, or sandy, according to the amount of clay or sand they contain, and when the vegetable matter has been converted into the substance known as peat, the soil is termed peaty or boggy. Many kinds of vegetables such as potatoes, turnips, carrots, cabbages, and celery will grow very well on peaty soils when improved, as will also

some fruits, such as black currants, raspberries, and strawberries. In considering the qualities of the preceding varieties of soils and their different characteristics, there is another quality that clays possess which is of a great importance, that is, retaining the soluble, and thus most valuable parts, of manures until they are assimilated by the plants growing on them.

A great many experiments are made, and more or less carefully conducted by parties in all parts of the country and the results published in papers that reach nearly every one, to demonstrate the advantages arising from the use of different brands of artificial and chemical manures, but, it seems, that after all the old fashioned stable manure is able to hold its own, as taking one year with the other it contrives to suit most things. (1) No doubt the other manures are good and pay sometimes, but from what I have read, I think some of them are not suited to all seasons, giving results totally opposite when the latter happened to be wet or dry. We have used a fertilizer that, according to the analysis, contained as much plant food in a bag that a man could carry, as would be contained in as much stable manure as a horse could draw in a day (not a long distance either); but somebody was wrong—not us. The fertilizer was good but I would take the horse's day's drawing first.

Again, clays possess another quality (especially when they are dark coloured,) that is, of absorbing more heat than other soils, in the same length of time, but we must also remember that, when soils are very dry those that absorb heat most readily also lose it most readily. I am not going to go into the question of drainage, because I suppose no land is fit to grow continuous crops of different vegetables and grains that is not drained, either naturally or artificially, and as most crops grown in this part of the country require either to be got in as soon as possible, or to have the land prepared for them, it goes without saying that draining is a necessity. As water weighs heavier at a temperature of 40° than at any other, it follows that the sooner the cold snow water is made to sink away in the spring the better, and the more chance there is of the sun warming the land and getting it fit for crops. (2)

Lime is much spoken of as a manure and is I believe largely used in Great Britain for that purpose, and I saw in a Journal of Horticulture that a ton of limestone could be reduced to lime at a cost of one shilling. If that could be done here no doubt more of it would be used. (3) But I think that if land is dug in the fall the frost will pulverise the soil equally as well as a quantity of lime would do. That is another subject on which opinions differ.—fall digging,—we have found it most advantageous and always practise it when possible. I know it may not appear to do so much good on light or gravelly soils and perhaps it does not, but on stiff soil, I think there can be no question about the benefit.

I have no doubt gone over the same subject as Mr. Arnott, and may have not told it as well, but perhaps somebody else will feel called upon to contradict or confirm what I have said, and thus cause some more discussion which I understand we come here for. Plant food could be discussed at another meeting.

Destruction of Couch-Grass.

In answer to a query, respecting the mode of getting rid of couch or scutch-grass—*TRITICUM REPENS*—I beg to

(1) True, but there is not enough of it to be had A. R. J. F.

(2) And we must not forget that evaporation produces cold. A. R. J. F.

(3) The price of lime in the province is absurdly high.

A. R. J. F.

state that the only remedy for this great evil on a farm is its destruction, **ROOT AND BRANCH**. This difficult work can be performed at a reasonable expense. 1. By drying the land if it be wet, for in wet land couch grass is replanted at every motion of the implements in use, and, never destroyed. It is therefore indispensable to work such land only when it is dry. —2. Summer fallowing, in dry hot weather, is by far the quickest, cheapest and best mode of destruction. Plough when dry, then harrow in the heat of the sun, all these operations tend to kill the roots. Then either cross-plough or scarify. In all these operations the implement used should not be driven much below the roots of the couch-grass, in order to bring them all up to the surface, where the sun and wind will kill them. 3. For effective work, these operations of ploughing, harrowing and scarifying must be repeated several times, always in dry weather. The dragging of a single rootlet in wet weather is certain to break this rootlet into several seed pieces, each of which is sure to root, flourish and spread around amazingly in mellow dry soil. Therefore be careful.

The summer fallow might follow an early crop of green fodder (1) grown in early spring on fall-ploughed leas and either made into hay or fed to cattle as green food. In all cases the summer fallow pre-supposes a series of operations in the burning hot sun; and the latter end of July or the month of August is certainly the best time for such work.

The summer fallow can be followed by fall wheat or rye, with a heavy clover seeding the following spring or, which is better, by a good fall-ploughing, thoroughly water furrowed where needed, and by a green crop of some kind the following year, taking care to keep such crop perfectly clean.

Such treatment is sure to eradicate the worst couch grass. It will do more, it will make of the worst field on the farm one of the most productive, provided the after treatment be thoroughly husbandlike.

It is proper to add here that the advice given above is sure to destroy, besides couch grass, all weed pests on the farm, no matter of what kind.

ED. A. BARNARD

CORRESPONDENCE.

Montreal, Dec. 14th, 1892.

Dear Mr. Barnard,—Many of your readers have, with astonishment, called my attention to the fact that in an article "on the Provincial Exhibition of 1891, held at Montreal, translated from the English of A. R. Jenner Fust by H. Nagant, November 1891," no mention is made of the Percheron and Norman horses! Now, these, alone, were equal in number to all the other breeds of draught and carriage-horses put together, and, as to quality, without mentioning those of the National Stud, the Percherons shown by Messrs. Michelet, of St. Marc, Campbell, of Lachute, the Deaf and Dumb Asylum of Montreal, &c. &c., received several prizes.

At the auction, held after the Exhibition closed, \$350 were offered for a yearling Percheron colt belonging to the Deaf and Dumb Asylum.

The prizes for roadsters and carriage-horses were carried off by the Anglo-Norman, and those belonging to Mr. Ness, M. C. A., Count Meroier, and Mons. Globensky, attracted general admiration.

These few remarks which will doubtless appear in the English Journal, will be sufficient to fill up the regrettable omission in an article otherwise very satisfactory.

During the last season, the stallions of the National Haras served more than six-hundred mares in the counties of Ter-

(1) Then called a bastard fallow.

A. R. J.

rebonne, Berthier, Bromé, Vaudreuil, La St. Jean, Bellechasse, Fortneuf, Champlain and Hochelaga. The establishment of the breed of horses which all are anxious to see created in the Province of Quebec, depends chiefly on the care taken of the foals to be born next spring, and on the persistence in this system of breeding (*esprit de suite*) pursued by the farmers.

Your excellent Journal is appreciated at its true value in all the counties I have just mentioned, and on that account I intend to send you an article on the steps to be taken as regards the system of crossing (*métissage*) laid down by the Haras. A similar plan of breeding has endowed France with its principal half bred and draught races of horses, and this it is that will, in this province, justify the outlay made by the legislature in the support of the Haras.

Accept the expression of my most distinguished sentiments.

(Signed) **AUZIAS TURENNE.**
(From the French.) Director of the National Stud.

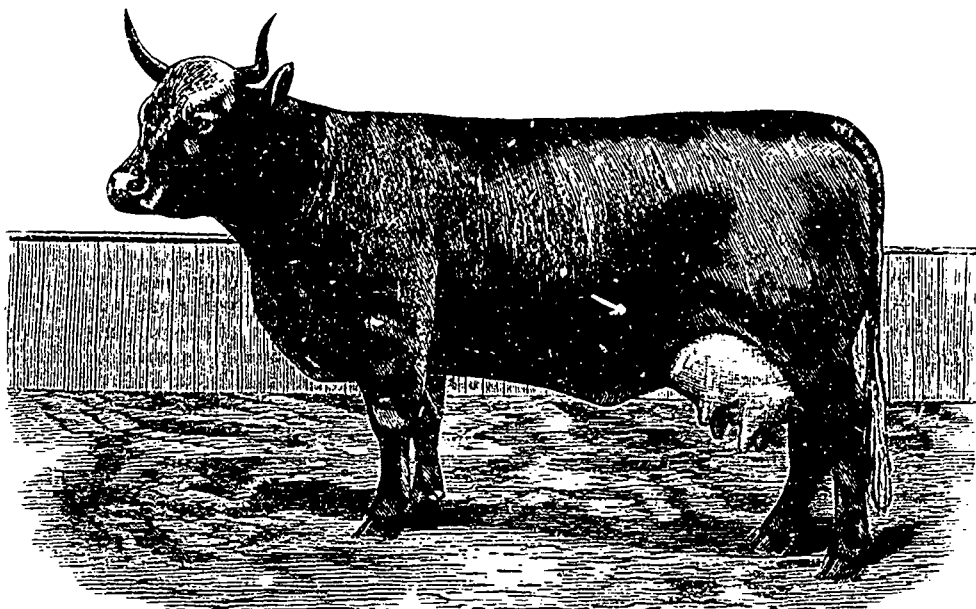
the last ten years, both practically and theoretically. The result of all that series of events, which have restored our dear country to the first rank which is certainly her own by the right of the centuries of glory and of inexhaustible riches, gives us an indisputable proof of the success of that regenerative work. Of course it is with inexpressible joy, that to-day I take up the part which Providence assigns to me here. I will not spare my labour, I assure you, and I shall be too happy to pay by that means my debt to our Canadian brothers. On the field, at the manufacture, in the city, let them be sure of our fullest devotion always. We beg them to give us their advice, their impressions and to relate their experience, in order that they firmly founded, we may go ahead surely and chiefly for the highest and greatest glory of Canada. From them I will then claim a little share of credit for the Mother country.

Yours very respectfully and gratefully. **H. P. DES ETANGS.**

P. S.—We shall always be at your service for every thing concerning our labour, agriculture, speeches, consultations, seeds, outfits of every kind &c &c, useless to tell you that again.

February 22th, 1892.

Monsieur des Etangs tells me he has taken a ten years



IMPORTED BROWN SWISS COW BRIENZ 168.

If M. Turenne will kindly look at the English report of the Exhibition, he will see that I, as usual, entrusted the subject of horses to a friend, who signed his note C. F. B. I mentioned the Clydes and Shires in a short paragraph, because I do know something about those breeds, but of the points of Normans and Percherons I am in a deplorable state of ignorance, not having had any experience in such, and not being in the habit, I hope, of saying anything, good or bad, about animals I do not understand. **JENNER FUST.**

TO ARTHUR R. JENNER FUST.

30 St. James St. Montreal.

Dear Sir,—You do me great honour in stating your opinion about the beet and sugar raising in the Province of Quebec in the last number of the *Journal of Agriculture*.

I have just signed a contract with the manufacturers of Fernham and Berthier, according to your advice. I hope soon to be able to prove my gratitude to Canada for giving me such a hearty reception. You know well that the introduction of the sugar-beet is a revolution in Agriculture.

I have been in a position to attend to the divers phases of that important improvement in France, and to take an interest in it for

contract with the Berthier-Farnham factories. Fifteen families, thoroughly skilled in the different operations of beet-growing, he expects to arrive from France before the commencement of the season. **A. R. J. F.**

John Craig Horticulturist to the Experimental Farms before the Agricultural Committee of the House of Commons.

In large fruits we are making a test of varieties running along two lines; first with the standard varieties chosen from the nursery catalogues of to-day. These are the product of the first introductions by the early settlers, as modified by selection and cultivation, and are now called the American varieties. These varieties have mostly come to us from the western and moister parts of Europe as our settlers came from that region. The French colonists, when they first came here, brought with them the best fruits of their native locality; the English settlers followed and brought their favourites; and the Scotch, Irish and Welsh did the same with theirs; so that, to begin with, as I have already stated, we had the fruits of western and the milder portions of Europe. I might say this class then composes one side of the varietal test. Secondly, the other class is made up of East European sorts which you have frequently heard referred to as

the "Russian apples," and I shall draw attention to them quite often in the course of my remarks, as we are testing this class extensively. In order to give you an idea as to the causes which led to their introduction for trial into this country, touching upon the early history of the movement, I will relate briefly a few facts relating thereto, upon which hinged the beginning of the work.

Ever since the introduction of the Duchess of Oldenburg from Russia, by way of England, about 40 years ago, there has been a growing interest in the fruits of that cold climate. The first large importation was made in 1870 by the United States Department of Agriculture. This comprised 252 varieties, but owing to the very crude state of Russia pomology, evinced by the many synonyms afterwards found in the collection, and coupled with long unpronounceable names—the work of sifting the good from the bad in this cumbersome list has been laborious and slow. Without going into details in regard to their merits and demerits I may say, that already a sufficient number of valuable varieties have been found to repay all the expenses incurred in the work of introduction and trial, and when we look at the possible advantages to be derived from these foreigners by uniting them with our native varieties, thus obtaining hardiness on the one side and possibly quality on the other, the benefits likely to accrue are inestimable. I have said that the first importation was made by the United States Department of Agriculture, but the credit of bringing this work to a practical and successful issue is due to a Canadian—one now departed—I refer to the late Chas. Gibb, of Abbotsford, Quebec. At great personal expense, in company with Prof. Budd of Iowa, he undertook the arduous task of visiting the various localities in which these fruits were grown, making notes on condition and quality of tree and fruit. The result of those investigations—a fair and unvarnished statement of facts—was published, and is now the foundation of our knowledge of the Russian fruits.

As far as we know at present, any apple tree not up to the grade of hardiness of Duchess, Tetofsky, Wealthy or Pewaukee is of doubtful usefulness for planting in the district of Ottawa or similar latitudes. I have referred to the work in apples. Experiments of a like nature have been carried on with pears, cherries and plums.

M. Craig was with the late Charles Gibb, of Abbotsford, for several years.
A. R. J. F.

EFFECTS OF FORESTS.

JOHN CRAIG, HORTICULTURIST TO EXPERIMENTAL FARMS BEFORE AGRICULTURAL COMMITTEE OF HOUSE OF COMMONS.

The effects of forestry on the climate of a country are nearly all beneficial; such as more equal distribution of rainfall. This is one of the most important points to be considered; another is the regulation of the temperature, by this I mean prevention in a measure of extremes, the possibilities of a sudden rise or fall in the temperature—changes so frequent in prairie districts—may be lessened. Then again evaporation from the soil is very much reduced. There is a vast difference between the condition on the surface of the bare and uncovered soil, and the soil on the forest floor. A forest floor serves the purpose of a sponge in collecting and holding the moisture which comes down in the form of rain. The fine root system of the trees assists in drawing up moisture from below. As the rain falls it collects around and within these forest centres which hold and give it up gradually, thus obviating spring torrents and summer freshets. Another important point which has not been sufficiently emphasised in connection with forest influence is the prevention of the strong force of the winds, with their great evaporating power. The evaporating power of the wind is generally in direct proportion to its velocity. The greater the velocity the stronger its evaporating power. Thus we can see the value of shelter belts. The more protection we have, in the way of shelter belts the less sweeping winds we have, and the moisture is taken less rapidly from the soil. There is no doubt that as soon as we get in the North-West a sufficient amount of forest area to mitigate to some extent the force of the winds, we shall have a much less rapid evaporation and much more favourable conditions, for fruit culture and agricultural operations generally.

By Mr. McGregor:

Q. Would that affect garden- too?—A. Certainly. It would act in the direction of preventing the direct action of the sun's rays, and be of great assistance at the time of seed germination in the spring, as very frequently the first sowing of garden seed is much disturbed by spring winds. Among the most promising varieties of forest trees for giving quick shelter, I wish to draw your attention to a class destined to be one of great service in the North-West. I refer to the test-

ing of a large number of fast growing willows and poplars which have from time to time been introduced from East Europe and the plains, and steppe country of Russia. We have now growing at the Central Farm, raised from cuttings, several thousands of these willows and poplars which will be increased as rapidly as possible. They are a remarkably fast growing hardy race of trees. We have already tested them at a few points in the North-West in small quantities, and they have given every indication of hardiness and success. We are now making arrangements to continue the work of distributing next year by sending a large selection of these to a number of points in Manitoba and the North-West. Among those which indicate great future usefulness are *Populus Certinensis*, *Pop. Petrovsky*, *Salix acutifolia* and *Salix laurifolia*. If we can introduce and establish at different points groves of these hardy fast-growing poplars and willows, and thus obtain a little shelter, we may hope a little later on to introduce some of the more tender and valuable sorts which are not able to withstand the rigors of the climate unprotected, and so, by making a small beginning, our woods may be gradually increased.

For the Dairymen's Association Meeting at Montmagny; 1892

Our excellent friend, the Hon. J. J. Ross, has, more than once at these most useful meetings, inculcated the valuable but by no means novel lesson, that we should not put all our eggs into one basket. Monsieur Bouquet, the manager of the Banque Jacques-Cartier, following in the same road, in his address to the shareholders, 1890, showed that Montreal alone was paying \$2,000,000 a year for beef to the province of Ontario, and upwards of \$500,000 a year to the United States for hogs. Is this, to continue for ever, this importation from abroad of the main articles of human food? Are we never to even aim at the supplying of our home-market with beef and pork? The answer is plain: as long as we persist in rearing breeds of cattle that are comparatively unfattable, so long shall we be unable to make beef fit for respectable tables; and the same may be said of pork.

There is, prejudice apart, no earthly reason why the same farmer who daily sends his milk to the cheese-factory, or the creamery, should not also at intervals send beef to the butcher. Surely, what other nations are doing we can do! Our soil is not inferior to their soils; our cheese is allowed to be as good as the best of the English cheese; nay more, the Gloucester tenant-farmers, to say nothing of the great landed proprietors of that county, are seeking for means of education in their own proper business to enable them to compete in their own market with the impudent little province of Quebec, which is interfering sadly with the profits of the former, and, consequently, with the rents of the latter.

Whoever of you travelled in Switzerland some 40 or 50 years ago, must have been struck, if he kept his eyes open, with the inferiority of the general construction of the dairy-cattle of that country. Good milkers, no doubt, many of them were, but bony, ill-shaped, hard-fleshed, big-headed, paper-skinned brutes, unfattable at any age, and only arriving at maturity—if they ever did mature—at the age of 5 or 6 years. Visit the same country now, and what do you find? The whole appearance of the herds is altered. The Swiss have gradually created a type of dairy cattle combining aptitude for the pail with a ready propensity, to take out meat. M.M. Huguenin, brothers, at Maix Rorhat have a large herd of cows averaging about 20 lbs. of milk a day, during a season of 330 days—6,600 lbs. a year, and attaining the satisfactory weight of from 1,500 lbs. to 1,700 lbs. at 5 years of age. And it would be superfluous to remark that the same rule has been observed in Switzerland as in other countries that have improved their stock: rigorous selection of the parents; the best specimens of the purest and most carefully bred herds were chosen, and even with all this care every calf was not reared as a breeder. The best of the bulls were kept, and

the other males castrated, and the same cautious procedure was followed with the heifer-calves, the inferior ones, if not killed for veal, being shipped off to the neighbouring departments of France at the age of ten or fifteen days: at all events, they were got rid of somehow or other.

And is France behindhand in improving her stock as regards the production of both milk and beef? By no means. What have the great Norman dairy-farmers been doing of late years? Have they been idle? Let M. Turenne answer:

"The Norman milch-cow unites perfectly the two essential qualities of the abundant production of very rich milk and of an excellent body of beef. She will give from 25 to 30 wine-quarts of milk a day, from which 2 lbs. of butter can be made. The Norman cow, reaches the weight of from 1,200 lbs. to 1,800 lbs., and is easily fattened at any time, which enables her to supply for slaughter, after an abundant lactation, a very remunerative return of meat." And I beg to call your attention particularly to the following observations which I endorse most cordially: "It is to the breeders interest to possess cows that, after having furnished a copious supply of milk, can be sold off without any loss, if not with any great profit. This double destination, too, has a far greater advantage for breeding; for the male calves, which are not to be kept as bulls, make rapidly maturing and easily fattening oxen. Norman oxen, fattened at from 2½ to 3 years old, average from 1,500 lbs to 2,000 lbs. apiece. It is not rare to find 3 year olds weighing 2,400 lbs. and the meat sells in the Paris markets for a cent a pound more than the special races for the shambles, as the Durhams, Limousins, &c

As regards the above statement of the quantity of milk yielded daily by the Norman cow, I think there must be an error of some kind. Two pounds of butter from 30 litres of milk, would argue that 35 lbs. of milk were required to make a pound of butter; if such were the case, the milk could hardly be termed rich. (1)

For many a day, La Sologne has been stocked with sheep free at liberty over the barren sands and poverty-stricken wilds. Now, a very different state of things is to be seen. The country is full of fine cattle, adapted both to the dairy and the butcher's block, and I am not surprised to hear that those of the older inhabitants that remembered the ancient race of Sologne cows were astonished at the sight of the splendid specimens of the modern breed exhibited at the last show at Lamotte-Beuvron. Formerly, the milch-cows were small, angular in build, lean in the neck, with a narrow brisket, and sunken along the back. Now, these unsightly animals have been replaced by a very different style of beast. Norman bulls have been imported; judicious crossings have been made; the "landes," wherever feasible, have been sown down with grass-seeds; the winter accommodation has been improved, and the upshot of it is that all the judges at the above show agreed that very great progress had been made in the double production of milk and meat.

And what shall we say of my own country, England? There, at least, no one dreams of rearing cows for the dairy that after a "copious lactation, are only fit to be thrown into the nearest ditch." Look at the great town-dairies of London, Manchester, &c., and what do you see? Grand, well-bred Shorthorns, giving from 20 to 28 quarts of fairly rich milk a day, and, at the end of their term of life, at 7 or 8 years old, turned over to the butcher long before age has rendered their meat unfit for the table of even the middle classes.

Look, again, at the butter-dairies of the West, in Devonshire, Cornwall, South-Wales, and almost the same thing presents itself. The cattle are smaller, it is true, but the North-De-

vons, the Welsh-runts, are all producers of the finest quality of meat, as well as yielders of lots of good milk. No such thing as a "general purpose cow," is not there? Why all our English cows except a few Herefords are general purpose cows; and we really do know something about our business.

And our own Gloucestershire dairy-cows, whence proceeds the well known Gloucester cheese, what are they? By the bye, their owners are not by any means well inclined towards your noble society, since they attribute, in large measure, the falling off in the call for their commodity to the malevolent efforts of the Dairyman's Association of the province of Quebec. Well, what are our cows? They are what would be called in this country "grade shorthorns," almost all of them. Here and there may be found cattle with some of the marks of the old Gloucestershire race—low backed, high rumped, lean in the thighs—but, almost without exception, they bear the stamp of the pure shorthorn bulls introduced into most of the herds some 80 years ago. Are they profitable? Well, the tenants will not change for any other kind, and they know their business, as they must do, seeing they pay \$11.00 a year rent for every acre of land they farm, the tithes and rates bringing the annual burdens up to \$15.00.

What do these cows return to their owners? Each cow, on an average yields about 500 lbs. of cheese during the summer, and some 40 lbs. of butter in the off seasons, besides the calf, and the whey for the pigs, making a gross return of about \$80 a year. They are not kept till the meat is hard and horny, but sent to the butcher when in full vigour of appetite and power of thriving, and their weight runs about 850 lbs. to 900 lbs. the four quarters, making the cows worth, at present prices, from \$95.00 to \$100.00 apiece.

Mind, please, I am talking of "Dairy-shorthorns," not of those exhibition cattle that have been dried off for generations as soon as it was safe after calving to enable them to breed as many calves as possible for sale. No one would ever dream of keeping such cows as these on a dairy-farm, and it is they who have given such a bad name to all the shorthorn tribes, though among them may be found some of the best milkers in the world.

If I were starting a herd of dairy-cattle in this province, I am inclined to say that I should look out for a good lot of ordinary cows, of the same stamp that the best Montreal milkmen keep, and put them to—well, to what bull? If I could afford it, I should certainly import a "Dairy-shorthorn" bull from England; if not, perhaps Mr. Abbott, the p. cmier, would let me have one of his Guernseys. I do not know whether any of you have inspected this herd. It is kept at Ste. Anne de Bellevue, and is well worth studying. Our friend, Mr. Fisher, has some of them, and has, I believe, experimented in crossing them with the Jerseys. My love for them flows from having bred them for some years in England; consequently, I know what they will do. They are hardy; great milkers; their milk is very rich; they only demand sufficient food in proportion to their production; they are mild and gentle in their manners; the very bulls are quiet, if properly treated; any bull can be permanently injured in his temper if the boys about a farm are allowed to torment him—and when the period of lactation is over, the cows take on flesh as rapidly as need be.

The Guernsey cow is no common looking brute; she weighs from 900 lbs. to 1,200 lbs.; her form is wedgelike, high and broad behind, and narrow in front, but not scanty in the brisket. An unprejudiced person passing judgment on a Guernsey and a Jersey would say that the former was the more business-like beast.

And; I think, with such a herd, composed, as I said, of Montreal dairymen's cows and a Guernsey bull, I should not be far wrong, whether I went in for cheese or for butter, and

(1) The litre is wrongly translated a quart, it equals 88 of a quart therefore 25 litres = 32 quarts.

there would be no necessity for throwing the cows into the nearest ditch when they had finished their "period of lactation," nor of knocking the bull-calves on the head as soon as they were born to save the milk necessary for rearing them.

And, now, what is our cow going to give us? She has to yield, during her life-time, calves, milk, and manure, ending in being turned into beef before she is too old to be palatable.

And, first, of the calf. If a bull-calf is dropped at a time of year when veal is likely to be dear, it will pay as well to fat it at once as to keep it longer. The principal things to be attended to in fattening calves is to take them away from the dam as soon as born; to keep them warm and clean; give them their food regularly four times a day, and, above all, to see that the temperature of their food is never below 90 °F. Nothing is more likely to produce diarrhoea in calves than cold milk.

After the calf has had, say, three weeks of new milk, half the quantity may be taken away and replaced by skim-milk, with from 2 oz. to 4 oz. according to size of the calf, of crushed linseed, made into a jelly with boiling water, mixed up in it.

If the calf is to be castrated and reared, the new milk may be stopped after a fortnight, and the animal be fed entirely on skim-milk and linseed. At 8 weeks old a very little pea-soup may be added. The same food and treatment will answer for the heifer-calves that are to be brought into the general herd. No good cattle can be reared on skim-milk alone.

Milk—What use are we going to make of our milk? must be the first question: are we going to make cheese or butter? The answer to this depends upon two things: the soil of our farms and their situation. No one who understands the question can doubt for a moment that one soil produces better butter, another produces better cheese, than another. Our Gloucester-vale produces excellent cheese, but the butter is too high-coloured and there is a rankness of flavour about it that consigns it to the tables of the poorer classes.

The vale of Aylesbury, on the contrary, produces such delicious butter, that the farmers of that rich district would be mad were they to make cheese of their milk.

New grass will make good cheese, but to make good butter demands old pasture, containing a variety of grasses, of which, I regret to say, there is very little in this province.

As for the situation of our farms, if a cheese-factory is handy and a creamery far off, the former will, naturally, have the preference.

Summer-feeding of cows.—In summer, the cows will of course be on pasture. Shelter during the heat of the day may be provided by putting up a roomy shed of rough boards. I need not say that a copious supply of clean water is desirable. After the first flush of the grass is eaten down, additional food should be given: a pound or two of decorticated cotton-seed, and the same of bran; or a couple of quarts of oats; anything, in fact, that is the cheapest in the market, may be given to each cow, taking care, of course, that each gets her fair share.

It can pay no one to let cows roam over a lot of bare clover and timothy lea during the months of July and August, where all they can find to eat is the roots they pull out of the ground.

Any of the green-crops I spoke about at the Association's meeting at Sorel will now come in handy. See the Report for 1890, p. 145.

Having carried the cows safely and profitably through the summer, the next thing you must see to is that they go into winter quarters in good condition. Now, that I presume to say most of you have learned that "Winter-dairying," with a judicious system of feeding, may be made to pay quite as well if not better than summer dairying, I need hardly say

that drying off cows as soon as November begins is no longer the practice of the farmers of the province.

And, now, the cows being safely settled in their warm, well ventilated stables, we look over them and study the condition of each individual. Some have recently calved and are full of milk; others having dropped their calves early in the previous spring are well on towards calving again; a last lot, not being up to the mark as yielders of milk, are destined to be turned out of the herd some way or other, and it is to these that I wish to call your special attention. We will take as an example, a cow that is not in calf, and that has been giving, we will suppose, some 12 to 16 lbs. of milk on the ordinary food she has been receiving when at large. I propose to feed the cow so that she shall not only increase in milk-yield but put on a fair quantity of fat at the same time, becoming in from 12 to 16 weeks a fair butcher's beast.

I suppose most of our farmers of the progressive kind have got into the habit of growing either ensilage or roots. As a foundation, then, for the food of this special cow, we will start with a daily ration of, say, 30 lbs. of ensilage or roots, always bearing in mind that mangels, carrots, or parsnips, can be given at any hour without fear of making milk taste, but if swedes or white turnips are dealt with, they must be given immediately after milking, when the digestive organs of the animal will in their action carry off any bad flavour those roots would otherwise impart to the butter.

Oat straw may be put into the rack as a first feed in the morning, and if any remains uneaten, it can be thrown down on the floor as litter; stale, blown-upon straw should never be allowed to remain in rack or manger.

Timothy hay you will of course keep for your horses; clover-hay your in-lambd ewes will be very grateful for, it being a highly nitrogenous food; more ill-success in a breeding flock is brought about by stinting the ewes of nitrogen in their rations than by any other cause. In my early days of farming, I suffered a terrible loss in my flock of 260 ewes from ignorance of this fact.

Still, as few farmers here keep more than from ten to 15 sheep, a considerable quantity of clover will be left, and a better use for it cannot be made than to cut it up into chaff and give it to our barren cow mixed with meal.

Now, what more shall we give her? We want to produce both rich milk and good, tender meat. I am, I may tell you, not one of those who believe that food has no influence on the quality of the milk produced. Grains, straw, and mangels, will make a cow yield lots of milk, but the quality will be so poor that the boldest city milkman would not dare to resort to the pump to increase his profits. To this ration of grains, straw, and mangels, add a few pounds of cake, or of linseed and grain, and you will soon see to your satisfaction that judiciously selected food not only adds to the quantity of milk produced, but also to its richness in butter-fat.

In choosing our meal-mixture we must have regard to the age of the beast we are dealing with. To our barren cow we do not intend to make any great addition of lean meat. All we can hope to do is to fill up the tissues with fat, not forgetting that the same constituents that *marble* the lean will increase the richness of the milk.

You all grow oats, most of you grow maize, the pea-crop is common enough, and you all ought to grow an acre or two of flax. Mind, I do not by any means intend to decry the use of cake, whether of linseed or of cottonseed, but it is just as well to use home-grown food, as some of you dislike laying out ready money, and others live so far from the great centres of commerce that the freight of the above handy foods becomes a serious matter.

Take then, for one cow that is still yielding a moderate quantity of milk, about a bushel of chaff, half clover half

sweet, fresh straw, moisture it with water—hot or cold—and mix well up with it six pounds of the following meals :

- 3 lbs. of maize ;
- 2 lbs. of pease.
- 1 lb. linseed.

Should you have no home-grown maize, you may substitute for it 4 lbs. of oats, and towards the end of the period of fatting, an additional half pound of linseed may be added.

The grain, well mixed up together, is to be *finely* ground at the mill.

After the meal and moistened chaff have been turned over thoroughly, they should be kept to sweat for a few hours. This will aid digestion. A wide box, with sides, say, 9 inches high, is a handy thing, in the absence of a stone floor, to mix in. It should be kept perfectly clean and sweet.

The young castrated males, of, say, two years of age, being yet growing both in muscle and bone, will require a somewhat different prescription. The following I have found useful :

- Roots or silage.
- A bushel of straw-chaff ;
- 6 lbs. of pease-meal.
- 1½ lbs. of linseed.

The pease and linseed to be ground up together, as before. If there is any difficulty in grinding, the substitution of 2 lbs. of oats for 1 lb. of the pease will make the meal more perfect. The chief thing is, that every grain of the linseed must be cracked. It has been found by experiment that out of a thousand grains given to a beast *uncracked*, two-thirds pass into the dung undigested. Barley, of course, may be substituted, weight for weight, for maize, if cheaper. Fresh oat-straw, in all cases, in the racks the last thing at night.

I need hardly say that the *sloppier* the food your regular milch-cows are given, the better. Not so for those you are milking *and* fatting.

I have used this form of food for years, and have always been satisfied with its effects. I have no experience in the use of bran, except in mashes for horses, so I do not mention it, but I have no doubt about its utility for milch-cows in general, provided its cost does not exceed \$14.00 a ton.

Manure.—In my younger days, it was the custom for the more advanced farmers in England to feed their fatting beasts in a rather extravagant fashion. Two bushels of roots, hay *ad libitum*, and 14 lbs. of linseed cake was a common dietary. They thought, and with some degree of truth, that although the bullocks could not assimilate the whole of the nutriment contained in the food, the balance re-appeared in a remunerative form in the dung. No man, at that time, expected to make a profit out of fatting beasts. One of our best farmers in the Eastern counties declared publicly (in 1848) that he lost \$10.00 on every bullock he fed in the winter—he used to turn out 250 fat—and they were really fat-beasts a year—but that he recouped himself by the manure they left behind them.

But this extravagant system has been long exploded, and every one, now-a-days at any rate, aims at making some profit out of his expenditure and labour in preparing meat for the market.

The only constituents of food which are of importance as ingredients of manure, are the nitrogenous substances and the ash constituents. In cases where the bodily weight is increasing *and* milk is being produced, the amount of nitrogen and ash in the manure will be less than that in the food in direct proportion to the quantity of these substances which has been converted into animal produce. Part of the nitrogen and ash is left undigested during the passage of the food through the alimentary canal : these are voided in the solid excrement. The digested part passes into the blood, some of it may be converted into increase of weight or into milk—into both in our case of the milch cow being fattened

—and the remainder is finally separated from the blood by the kidneys, and is voided in the urine.

Now, the proportionate quantity of both nitrogen and ash contained in the excrement of animals will perhaps surprise you. For every hundred pounds of nitrogen administered in

the food of an ox there are stored up as increase.....	3.9
“ “ voided as solid excrement	22.6
“ “ do as liquid do	73.5

100.00

That is, the liquid and solid excrement together contain 96.1 % of the whole nitrogen given in the food.

Of the ash constituents, 2.3 % are stored up as increase, and 7.7 % are voided in the total excrements.

You see then that the liquid excrement contains about 3½ times as much nitrogen as the solid, and, hence, you will see the absolute necessity of preserving the urine of your cattle by absorbents of some kind ; for I do not think liquid manure-tanks are very likely to exist on many farms in this country. Nitrogen, in its cheapest source, that of nitrate of soda, is, thanks to the abominable row in Chili, whence most of it comes, worth \$10.00 a ton more than it was last year ; that is to say, that whereas nitrogen could be bought in England for 10 cents a pound, it now costs at least 12 cents.

What quantity of the 100 lbs. of nitrogen falls to the share of the milk of our barren cow it would be a different task to determine except by an analysis of each individual instance ; but of course the manure from her would not be as rich as the manure from a fatting ox.

I do hope, in conclusion, that you will do your best to increase the supply of good meat in the Montreal market. To pay 15 cents a pound for ribs and surloins of beef—and that is what the West-end butchers are now charging—, even if the meat were of the best quality, seems to me to be rather too much of a good thing, considering the prices the farmer gets for his cattle on the foot, but I should not grudge the price if the farmer got his fair share. At present, the butcher seems to be doing well, and the feeder of the beasts to be left in the lurch.

(From the French.) ARTHUR R. JENNER FUST.

DE OMNIBUS REBUS.

Sulphuric acid.—Mr. MacPherson, speaking of the Babcock test, stated that sulphuric acid—the brown quality of course—though only costing one cent a pound in England, cannot be bought for less than two cents here. At the former price, superphosphate could be made cheaply enough on the farmer's own premises. One ton of bones and half a ton of sulphuric acid would only cost \$38.00, and would be rich in nitrogen as well as in soluble phosphoric acid = 10 arpents.

Udder clap.—This complaint, called in England “ corded teats,” is not uncommon here, and if the following treatment of cows is common in this county, it is no wonder. “ Oh, Sir,” said a Glengarry damsel to me, the other day, “ when the factories close, we often have more milk at night than our vessels will hold, and then we leave it in the cow till the next day.” Fact, I can assure you. I was not surprised to hear that out of her father's 13 cows several had one, and some, two teats corded.

Australian butter.—The last importation of Australian butter into England sold well. The best fetched 126 shillings for 112 lbs, the best creamery only 110 shillings !

Adulterated milk.—They are getting savage in Montreal. M. Daigault, a milkman, was fined, on the 28th January,

\$40.00 for selling 15 % watered milk. By the bye, all dung in farmers vehicles must now be covered in this clean town. On January 27th, twelve farmers, or market gardeners, were fined a dollar each, and, the following day, twenty-eight were fined the same sum, for carrying dung uncovered in their sleighs!

beef in England.—Many people imagine that large bullocks sell better in England than small ones. It is quite a mistake. In the market reports, in the Agricultural Gazette of January 18th, Scotch beasts weighing dead 90 stone of 8 lbs. = 720 lbs. are quoted at 4s.11d. a per stone, heavier Scotch beasts, weighing 100 stone, = 800 lbs, at 4s. 8d. a per stone, the smaller beasts being worth $\frac{2}{3}$ of a cent a pound more than the larger. And the same with sheep and pigs, only "more so."

Horse-beans.—I have been asked to state what sort of bean is the best for sowing on rich dry-soil in the county of Quebec.

Beans are of three principal kinds: harrow, tick, and pigeon-beans. The first is the largest, the last the smallest, of the three kinds. A bushel of pigeon-beans weighs about 68 pounds, and, if they can be had here, I should prefer them.

Beans should be drilled in rows about 24 to 27 apart, and pretty thick. Three bushels an acre will not be too many. They may be sown on land drilled up as for mangels and covered by the harrows, or, as we always do in England, simply drilled on the flat.

When coming up, harrow once or twice, and keep the horse-hoe going between the rows as long as possible. A good many years ago, I saw pease and beans sown together in Scotland, the pease-haulm being used at harvest to tie the beans with; but I do not like the practice, since the pease would smother the lower blossoms of the beans and prevent the pods from setting, and these lower pods are always the most prolific.

One thing is to be considered when it is proposed to sow beans in the county of Quebec: will they ripen? Unless I could get my seed into the ground by the 8th May, I should be loth to try beans even in the neighbourhood of Montreal, and, as I understand it, the seasons at Quebec are even ten days later than they are here.

Beans should be set $2\frac{1}{2}$ or 3 inches deep. If they must be sown broadcast, plough them in; but broadcast-beans give a plentiful crop of rubbish and very little pulse.

For hard work, in winter, there is no food for horses equal to beans, but they must never be given to horses standing idle in the stable as they have tendency to produce eruptions of the skin. Half a bushel of beans, in our English farm-stable, takes the place of a bushel of oats; pretty nearly the same in weight, and much superior in nutriment. We never allow our South of England farm-horses to be without beans in winter.

Bean-straw, rough stuff as it looks, is about as good as moderate hay, even theoretically:

	Digestive nutrients.		} Wolff.
	albuminoid.	carbohydrates.	
Medium hay.....	5.4	41.0	}
Bean straw.....	5.5	35.2	

Whereas pea-straw only contains 2.9 % of albuminoids and less carbohydrates. Practically, having grown and used beans for twelve years, I am sure that bean-straw is a most useful food in the yard, especially for young cattle and colts. as well as for in-lambd ewes.

We harvest beans in England in two ways. either by pul-

ling them up by the roots, or by cutting them with a hook, called a bean-hook; but however it is done, there is always a lot of dirt among them, and they are a bother to thresh in consequence, whether the threshing is done by the flail or by the machine.

OUR ENGRAVINGS.

Swiss cow.—The first engraving I have seen of this breed. She must be completely suited to my idea of what a cow ought to be, if the account annexed is authentic.

Head of a Cleveland Bay.—A shade coarse in the muzzle; but these horses very often "throw back" to some remote ancestor of the earhorse tribe. A. R. J. F.

We give a picture of the head of what is considered one of the best Cleveland Bay horses ever brought to this country—Peacock 857 (1782). He was bred by John Gilloard, Craike, Easingwold, Yorkshire; sire Wonderful Lad (536); dam by Crowell; 2d dam by Salesman (416); 3d dam by Field-Marshal (582). He is now three years old, stands 161, weighs about 1300 lbs. He is a bright bay with black points; no white—a colt of great style and finish, with a fine set of



limbs, deep body, good back, beautiful head and neck, and an eye that stands clear out, while his disposition and action are all that any one could desire. After winning 2d prize at the Royal show in England, he was imported last September by his present owners, Messrs. STERICKER BROS., Springfield, Ill., and won for them first prizes at the Illinois and St. Louis fairs. He can hardly fail to make his mark—a good one—on the coaching stock of this country.

The Brown Swiss Brienz 168, exhibited in the dairy division of the Chicago Live-Stock show last November, struck us as a notably typical specimen of her interesting breed, and we were glad to be able to arrange for the portrait (from life by Mr. J. W. Hills) which appears this week. The cow is a remarkable yielder. She made, at the exhibition referred to, three consecutive daily records of 3.25, 3.03 and 3.14 lbs. of butter fat, each of which is believed to be higher than was ever reported for any other cow. Brienz was born Nov. 15, 1880; was imported in 1882; dropped her last calf, Oct. 10,

1891. She weighs about 1400 lbs., her owner—Mr. ABE BOURQUIN of Nokomis, Ill.,—being a liberal feeder, and the breed having a considerable aptitude for storing up fat on which to draw as may be afterwards necessary.

Seasonable Notes.

MAKING PASTURES.

As good pasture land is always rich, it is only natural that such land should take easier to grass than poor land. It is, therefore, a good plan to sow grass seeds immediately after a bare fallow or after a root crop which has been eaten with sheep upon the land. It is the usual practice to take a grain crop in these circumstances, but many persons prefer to sow grass seeds at once, and this is called sowing "without a crop." Now, as a grain crop is worth £7 or £8 per acre, it is evident that sowing without it is rather an expensive way of going to work. For this reason tenant farmers usually sow their grass seeds with a crop of grain, and landlords, who have a more permanent interest in the land, are more likely to sow their grass seeds without the grain crop.

Land intended for sowing down to permanent pasture should be well dunged and limed, or roots should be fed upon it, so as to bring it into high condition. It is not advisable to sow to grass land in a foul condition, and hence the importance of fallowing in order to destroy weeds and bring the land into a clean condition.

THE SELECTION OF THE SEED

is of very great importance, and is a subject of some difficulty. There are many sorts of grasses, some of which are valuable, while others are worthless. The various kinds of grasses ought to be studied carefully, and there is no better way of learning to know them than collecting them and drying them between leaves of white blotting-paper. Although there are so many kinds of grasses, there are not more than fifteen or twenty which need to be introduced into good mixtures. A good mixture must, however, also contain several sorts of clover and plants of a similar character, of which the following may be considered as a fair illustration :

	lbs.
Cow grass, or perennial (overlasting) red clover...	4
White Dutch clover	4 (1)
Alsike clover.....	2
Birdsfoot trefoil.....	2
Suckling clover.....	2
Yellow clover.....	2
Yarrow, or millefoil.....	0½ (2)
Cocksfoot grass.....	3
Dogstail grass.....	1
Timothy, or catstail grass.....	2 (3)
Sweet vernal grass.....	1
Sheep's fescue.....	1
Foxtail grass.....	2
Yellow oat grass.....	1½
Perennial ryegrass (Pacey's)	5 (4)
Tall fescue.....	2
Rough stalked meadow grass.....	1½

36½

The grass seeds may be sown in August, but this plan can only be followed when they are sown "without a crop." A more usual plan is to sow them with the grass seed-barrow

(1) I should only sow 2 lbs. of white clover here, as it comes spontaneously on most soils in this county. A. R. J. F.
 (2) Yarrow is useless here. A. R. J. F.
 (3) I should sow 4 lbs. of timothy, to make up for the 2 lbs. of clover left out. More in the April number about this. A. R. J. F.
 (4) Mr Evans promises to have some Pacey's for this season's work. All other ryegrasses are useless here. A. R. J. F.

upon young corn in the same manner as has been recommended in sowing seeds for one to three or four years. When the corn is reaped the field is already green with the young grasses, which then grow with rapidity and yield a crop of hay or grazing for animals the following summer.

TREATMENT OF YOUNG PASTURES.

It is well known that when land is first laid down in permanent pasture it frequently yields a heavy crop the first year. The second year the crop is less abundant, and the third it still further declines. Perhaps the fourth year is the most trying for a new-made pasture, and after this period it slowly recovers itself, and by the seventh or eighth year it ought to be established. The appearance of the field is, however, still very inferior to that of an old piece of permanent grass, and, in some cases, twenty or more years must elapse before it arrives at a condition which we wish to see. In other cases the land never takes to grass, and after a number of unsatisfactory years it is again ploughed up for tillage. It must be the object of every good farmer to shorten this period of probation and to produce good and productive turf as soon as possible.

The difficulty seems to be to produce a thick sward or close "bottom" of grass, in which no bare earth is visible, and the entire surface is completely covered with a continuous "sole" or "skin" of grassy herbage. On examining a good old pasture, it will be seen that the clovers and trefoils occupy an important position as a sub-growth, and that the taller grasses rise above them in abundance.

Our object is best attained by the use of large quantities of manure. No kind of crop requires such a rich soil as pastures and meadows, and, therefore, every opportunity should be taken to nurse and encourage the growth of the grasses. The best applications may be described in homely language as dirt of all kinds, such as road scrapings, ditch and hedge scourings, or parings from ditches and hedges, pond clearings and composts, or mixtures of dead weeds and soil. Plentiful dressings of these and similar materials are particularly suitable for newly made grass land.

The question as to whether the crop should be mown for hay the first year, or grazed by stock, is an important one, but we incline to the latter method as less exhausting. (1)

It is true that when grass is allowed to grow to its full height, as it does before mowing, the roots become longer and stronger, as there is a proportion between the upward growth of stem and leaf and the downward growth of roots. This is known to be the case with clover, which, when mown, leaves the soil richer in root than when grazed by sheep. (2)

To mow a newly-made pasture may then be adopted, if we are prepared to manure the ground after the removal of the crop. But a more excellent way seems to be to allow the grass to grow to a fair height and then to turn cows or bullocks into the field and let them waste a little food. The waste is more apparent than real, and we shall find the benefit of this treatment in succeeding years. Sheep are not suitable for grazing a newly-laid-down pasture, as they are apt to bite too closely, and to injure the development of some of the finest grasses.

No treatment benefits grass land so much as grazing with bullocks which receive a little oil cake every day. Bullocks do not graze closely to the ground, and the cake more than makes up for any ingredients which they remove from the ground in adding to their own flesh and bones. By following

(1) I should graze with young cattle. No sheep for the first two years. A. R. J. F.
 (2) The oftener mown at full growth, the richer the land and the better the following wheat-crop. In England clover only stands one year. A. R. J. F.

the directions given, a good pasture may be formed within two years of the time of sowing it, and it may be relied upon as a source of profit after the fourth year from the same date.

IMPROVEMENT OF INFERIOR PASTURES.

A great deal of poor grass land is capable of improvement. At one time there was a rage for breaking up such lands and converting them into tillage. This was when wheat was dear, and was looked upon as the sheet-anchor of British agriculture. All this has, however, been altered by the great fall in the price of wheat, so that people now are disposed to convert their tillage land into pasture. We now think it better to improve a poor pasture than to plough it up; and hence a few words upon the improvement of such poor pastures may not be out of place.

In some cases drainage is advisable, while in others it is a doubtful improvement. Boggy or rushy land is very useful for summer grazing, and often lets for as much money as sound arable land. Such soils are better left alone. Hillsides abounding in springs sometimes require draining, but we leave this point open, only drawing attention to it as a possible means of improving pasture-land. We may be sure of one thing, namely, that wet land will not pay for manuring, and therefore, if it is not thought wise to drain it, we may rest assured that it is best left alone or in a state of nature, and used simply as a feeding ground for suitable sorts of live stock.

Naturally drained sound pastures which suffer from poverty are generally capable of improvement. A heavy dressing of road-dirt, lime and earth, or manure, or all of these ingredients combined, will usually make a rapid change in such pastures. If applied in winter the clods will become tender under the influence of frost, and the field should be chain-harrowed in March, or as soon as the ground is dry enough, in order to spread the manure and level the surface. The best implement for the purpose is a chain harrow of modern construction furnished with points which scratch up the soil and pull out the moss which so often covers poor grass lands. We should next recommend what is known as a "renovating" mixture of grass seeds containing white clover, perennial ryegrass, and some other good sorts of grass seeds. These renovating mixtures can always be purchased from good seedsmen, who will assist in advising as to the best sort of mixture for particular soils. This mixture will be distributed over the surface with the ordinary broadcast barrow, and harrowed in by again taking the chain harrow over them. The compost spread over the field will give a suitable bed for the young seeds, which will quickly germinate. Sheep are often useful for the same purpose, as they tread in and bury the seed by walking about in search of food. Grazing with cattle, especially when the animals are fed with oil cake in addition to the grass which they pull from the pasture, greatly helps poor pasture, and with such treatment we shall find that it rapidly improves. (1)

JOHN WRIGHTSON.

Extraordinary Potatoes.

A priest, a great lover of agriculture, has brought us a sample of potatoes, of his 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 *Syndicat No. 1*, may be considered from all points of view as a most valuable acquisition.

This variety yielded 400 bushels *per acre*, on two aigents 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

(1) Above all, keep pastures fed level, and, once a year, say, in this country, about September 1st, fed them down close.

A. R. J. F.

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 upon 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.

ED. A. BARNARD.

(From the French.)

Choice seed for sale.

We request our correspondents who have choice seeds 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.

Huntsville Happenings.

"I have used Dr. Fowler's Extract of Wild Strawberry in my family and can highly recommend it for summer complaint, diarrhoea, &c."—Mrs. Geo. West, Huntsville, Ont.

Can not Compete.

Misc Maud Grant, of Mountain, Ont., writes: 'I can recommend Dr. Fowler's Extract of Wild Strawberry for summer complaints and diarrhoea. There is nothing to compete with it as it succeeds even in the severest cases.'

For Over Fifty Years

AN OLD AND WELL-TRIED REMEDY.—Mrs. Winslow's Soothing Syrup has been used for over fifty years by millions of mothers for their children while teething, with perfect success. It soothes the child, softens the gums, allays all pain, cures wind colic, and is the best remedy for Diarrhoea. Is pleasant to the taste. Sold by Druggists in every part of the world. Twenty-five cents a bottle. Its value is incalculable. Be sure and ask for Mrs. Winslow's Soothing Syrup, and take no other kind.

Baby was Sick.

My baby was very sick with diarrhoea and after everything else had failed I tried Dr. Fowler's Extract of Wild Strawberry, the first dose gave relief, and a perfect cure soon resulted.—Mrs. John Clark, Bloomfield, Ont.

Sarah Marshall.

King St., Kingston, says: "I was afflicted with chronic rheumatism for years and used numerous medicines without success, but by the use of 6 bottles of Burdock Blood Bitters I was entirely cured."

"I am acquainted with the above named lady, and can certify to the facts as stated."—Henry Wade, Druggist, Kingston, Ont.

BURDOCK BLOOD BITTERS for the blood.
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CONSUMPTION CURED.

An old physician, retired from practice, had placed in his hands by an East India missionary the formula of a simple vegetable remedy for the speedy and permanent cure of Consumption, Bronchitis, Catarrh, Asthma and all Throat and Lung Affections, also a positive and radical cure for Nervous Debility and all Nervous Complaints. Having tested its wonderful curative powers in thousands of cases, and desiring to relieve human suffering, I will send free of charge to all who wish it, this recipe in German, French or English, with full directions for preparing and using. Sent by mail, by addressing, with stamp, naming this paper, W. A. NOYES.

820 Powers' Block Rochester, N. Y.