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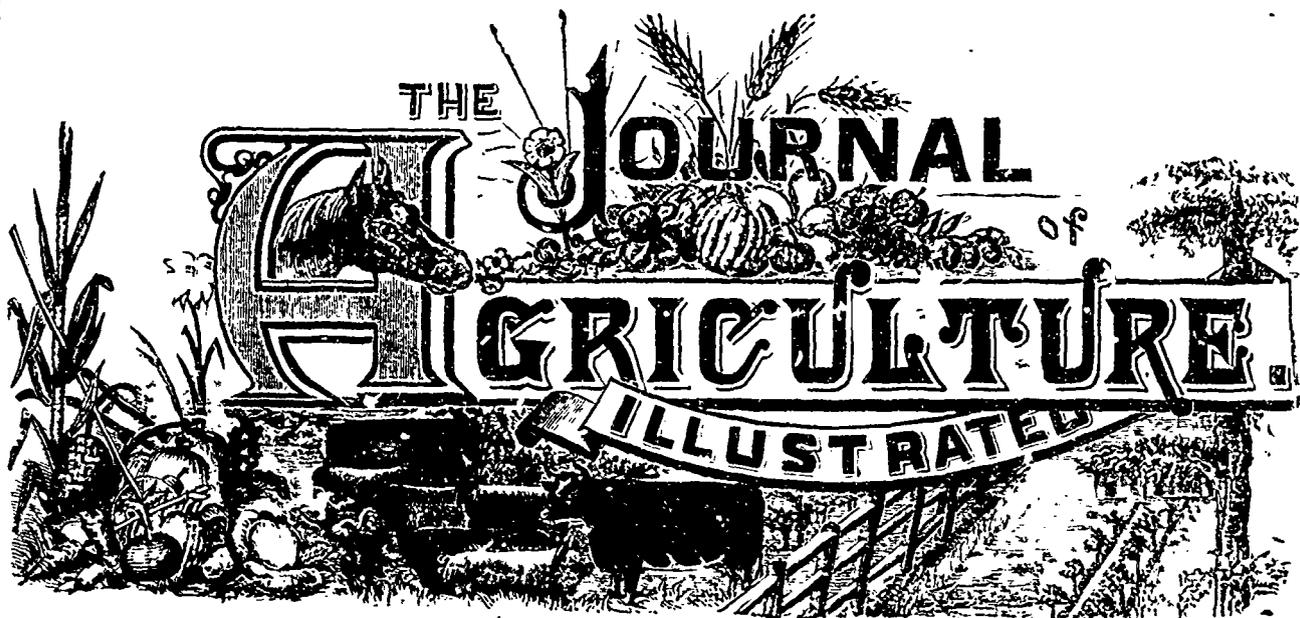
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## OFFICIAL PART.

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Report of a visit to the Nursery of Mr. Auguste Dupuis, Village des Aulnaies, Co. P'Islet, P' Q.

Quebec, July 4th, 1891.

TO THE HONORABLE H. G. JOLY DE LOTBINIÈRE, QUEBEC.

Sir,—In accordance with your instructions I have the honor to report:

That I paid a visit to the nursery of Mr. Auguste Dupuis, Village des Aulnaies, Co. P'Islet.

The nursery being situated on the south bank of the St. Lawrence, 71 miles N. E. of Quebec, affords the best means of observing the varieties of fruits and ornamental trees adapted to the climate of the Eastern portion of the Province.

Especially is this the case, because the proprietor is a gentleman of the highest integrity, intelligence, and urbanity,

who has made a life long study of horticulture and pomology, spent thousands of dollars in testing the different kinds of trees, and is public spirited enough not to study his own aggrandisement alone, but also to give his neighbours the benefit of his dearly bought experience. Thus to instruct and encourage them in the practice of a science which is rendered somewhat difficult by climatic influences, but which is attended by profitable result when properly performed, Mr. Dupuis is a public benefactor in this respect and deserving of the highest encomiums and success.

The nursery is a model of neatness and order, weeds are conspicuous by their entire absence, the trees are planted in rows at sufficient distances to allow the cultivator to work freely amongst them, and are labeled so plainly as to render errors in nomenclature impossible.

The system and order observed are at once enough to inspire purchasers with confidence, the trees show to better advantage, are more healthy, and free from insect or fungus than when the ground beneath them is covered with weeds.

The land of these nurseries is well adapted to the purpose, being composed of a sandy shale loam not too fertile but requiring the addition of some manure; which however is given moderately, because Mr. Dupuis (very wisely) does not desire a too vigorous or watery growth but wood which is perfectly matured.

As I before stated he puts all the new varieties he procures to this test, and if they will not survive, discards them as worthless.

In one place were rows of apple trees, about 250 in each, planted four feet between the rows—and in order to ascertain the aptitude of trees growing on the same soil and exposure, different varieties were planted in each row. While adjacent rows of Baldwin, Gravenstiens, Greening, &c., were winter killed, Fameuse, Duchess, Tetofski, St. 1 wrence, Wealthy and Golden russet were as sound and as vigorous as a Rock-maple.

In a new orchard of last year's planting containing 750 trees, the soil being rather loamy with gravelly subsoil, and with no protection except from the north, the rows of Wealthy were sound and vigorous and the Gravenstien all winter killed.

Mr. Dupuis says that with him apple trees are most in demand—the people generally prefer tall trees; many of them buy root grafts, cultivate them 3 years, then they transplant them into their orchards.

Good root-grafted apples are worth 1½ cent and after 3 year's culture they acquire a value of 40 to 50 cents. This is of much consequence to those planting large orchards, and careful gardeners do not lose more than 10 per cent of these trees. To show Mr. Dupuis' public spirit he also said: "Nursery men do not care to sell the root-grafts because they lose the profit of growing the trees, but I force the sale of root-grafts to induce people to plant orchards."

"It is also better for the dwellers in the North West, Manitoba, or in the remote Townships of this Province even, because the graft can be procured by mail. We received a single order for 15,000 root grafts from Elie Hardy of Ste. Anne de la Pérade. Hon. Louis Beaubien bought one lot of 4,000; 1000 for France."

I also obtained the result of Mr. Dupuis' experience as to the apples which have proved worthless on his grounds and all over the county, as no fruit of the varieties has been exhibited since the organization of the the l'Islet Horticultural in 1880. These are Baldwin, Talman's sweet, Rambo, R. I. Greening; Gravenstien and Alexander only half-hardy.

On the other hand there is ample proof that Duchess, St. Lawrence, Astrachan or Peach, Wealthy and Golden russet are quite hardy and profitable.

Of Grabs Mr. Dupuis has proved Transcendant, Montreal Beauty, Whitney and Hyslop, the best.

Twenty varieties of apples and 8 of new Siberians, 1 and 2 years' from the graft, are being tried and promise well.

PLUMS.—Of these, the old Orleans blue and white are the most esteemed and barring accident farmers admit that they pay better than apples. Mr. Dupuis' plum orchard is quite extensive and gives promise of a good crop, he has not suffered from Black Knot at present nor ouroulio—no doubt due to the admirable cultivation of his land under the trees—he says however that the black knot is spreading and he fears its approach. A check has been given to this dire disease by cutting the diseased branches as soon as it appears; and to encourage this practice the Horticultural Society wisely offers a premium to those who bring the greatest quantity of black knot branches to the show ground; loads of which are being brought annually and destroyed. Last year some of the directors thought this a useless expenditure of money, but so certain was our friend of the efficacy of such a practice that he proposes to pay these premiums out of his own pocket rather than it should be abandoned.

BLACK KNOT IN THE PLUM AND CHERRY.—This mysterious and destructive disease has hitherto baffled the researches of men of science, most of whom have attributed it to the action of fungi, but the observation of Mr. Dupuis, of l'Islet, and of the farmers of that county, where plums are extensively grown, has made the highly important discovery that grubs are found in the knots. This, he considers, settles, the question that the knot is caused by a fly which deposits its eggs on the branch where the grubs or maggots are hatched, which, penetrating the bark, destroy or obstruct the sap vessels and the sap in its return, after being elaborated by the leaves, must find a new channel, being impeded in its course, and thus the knots are produced. Mr. Dupuis' theory is that the sap is poisoned by the knot and kills the branch below it, in this I differ with him. My idea is that the sap in its return does not pass the injured parts, and as it cannot descend to perform its natural function, namely the formation of new tissue to increase the bulk of the tree, forms the excrescence which is called black knot. I submit this theory with deference to better authority in the hope that the discoveries of Mr. Dupuis and his friends may lead to a discussion and more thorough scientific research of this matter of such vital consequence to the successful raising of plums.

The disease having been ascertained, remedy should be within our reach.

Mr. Dupuis suggests cutting off the knots in July while the maggot or worm is active and thus prevent its escape to perpetuate a family of future depredators. To cut them off in the fall or winter would be utterly useless, because by that time the maggots will have disappeared.

The importance of the proof that the disease is originated by an insect and is not a fungus, is in the fact that we thus obtain a clue to its treatment remedially and must use insecticides if we desire to check its ravages. The success attained by experimentation in the line of spraying for the destruction of apple scale, ouroulio, &c., &c., with Paris green, London purple, coal-oil emulsion or even soap-suds, leads me to the conclusion that the same result might be effected as regard the black knot if one of these were applied at the time the flies were depositing their eggs in the spring. Should the knots appear, cutting them off in July, as suggested, would destroy the insects which might escape the spraying, and it is to be hoped that persevering effort and well directed experiment may conquer the pest which makes the production of this delicious fruit so precarious and disappointing.

Plum culture should certainly be guarded with the most zealous care in this district, for it appears that many new

plum-orchards are being planted this year, owing to the fact that last year more than \$10,000 worth of plums were sold in the three parishes of St. Roch, St. Jean, and l'Islet.

The new foreign plums are of great promise in this locality; "Lombard," "Greengage or Reine Claude de Bavoy" Bradshaw, Washington, Jefferson, Reine, and Imperial gage, all ripen a little after the old sorts and sell always at a big price, the others being then out of the market.

Mr. Dupuis showed me some trees of the plum "Mariana" which has been on trial 4 years and has proved thoroughly hardy, not a shoot having been injured, the foliage is quite peculiar but it has not fruited. Plum orchards are not planted on clay soils in l'Islet county, the trees do not thrive, because they grow too rapidly—and therefore not ripening their wood are winter killed—some of the old Orleans taken from St. Roch's and planted in Sherbrooke and vicinity did not succeed, the rich soil of Sherbrooke inducing too rapid a growth to resist the cold, this is a hint well worthy of notice to planters of plums in what would appear to be more favoured localities.

**CHERRIES**, up to the present, have been grown with profit at St Roch and in all the county of L'Islet, the Early Richmond taking the lead although the Montmorency ordinary, is a good hardy productive sort. The Hearts and Bigarreux are not hardy, the new Russian varieties have not yet been tried, trees of low stature are preferred because the injury from frost is caused by the cracking of the stem, and if low trees are planted the top soon grows sufficiently to shade the stem.

Currants are extensively grown, and the old red Dutch and White grape are the favorites, the former yielding more fruit to the acre than the Versailles.

The currant bushes are now laden with fruit and the crop is estimated at 300 gallons. I enquired if Mr Dupuis was troubled by depredations of children in the fruit season, his reply was characteristic of the man, he said: "Oh no, I employ all who like to come to assist in the picking and after the main crop is secured I give them the privilege of taking the gleanings for themselves, in this way I have no trouble."

**GOOSEBERRIES**.—Houghton and Smith's seedling are the only sorts propagated because they are the most productive and do not blight, the "Industry" has not been tested. I was a little surprised to find that Mr. Dupuis had not tested so useful and popular a variety as the *Industry*, thinking I must confess he was a little behind the times in this respect, but my remarks elicited the following:

"There is a magnificent variety cultivated in different parts of the county for over a century, which must have been imported from France I am now propagating this variety. Its very large size and sweetness ought to make it most popular on the market. I believe it has not been disseminated as much as the American varieties, because the plants do not make any sprouts from the roots and therefore cannot be divided so easily as the American varieties."

I hope he will continue as quickly as possible the propagation, because such a variety as he describes must be a very valuable acquisition.

**RASPBERRIES**.—Cathbert, Bucknel, Orange, Philadelphia, and Red Antwerp, of Hudson River, are all hardy and do very well.

The Gregg black cap is hardy but the fruit of medium quality; the Dewberry is not sufficiently hardy and needs protection.

The **STRAWBERRIES** which succeed best are the Wilson, Albany and the Sharpless.

**PEARS**.—Some years ago the Flemish beauty and Louise Bonne de Jersey pears thrive well and bore abundantly, maturing the wood perfectly, but have since failed.

Although the culture of fruit may be the most important

in an economic point of view, the growing interests and advantages of ornamental planting have not been lost sight of, and considerable study and experiment have been brought to bear upon it which will prevent those who wish to embellish their premises with ornamental trees, shrubs, and plants, from the disappointment and loss they suffer by being advised to plant trees altogether unsuitable for their purpose.

Mr. Dupuis kindly called my attention to his collection of ornamental trees and shrubs which was more extensive than I could have supposed considering the locality I was in. I was thus enabled to judge for myself of their adaptability greatly aided by the remarks with which he favoured me. The following is the list with comments thereon.

**Able (Populus) Snowy Maple-leaved**.—Of these there were some large specimens, it is a tree of rapid growth, perfectly hardy, the leaves of which are glossy green above and white beneath—when young the leaves are large and handsome and the tree umbrageous—but when it attains a certain age the leaves are small and the branches straggling, for this reason it is not propagated or recommended to planters.

**Acacia** is no longer reliable, trees 20 years old were frozen.

**Ash, White**—growing well, but the soil of the nursery is not deep and rich enough for a vigorous growth, it is propagated at a little distance on a moist soil—beautiful tree.

**Ash, European**—is very hardy and fine, but not superior to the American white.

**Ash, oak leaved**—not hardy.

**Butternut**.—This beautiful tree is hardy and grows as quickly as it does in the New England States. Only a few specimens in the grounds, none propagated for sale.

**Black Walnut**.—The row of 3 years old plants are vigorous, expect to be more successful with this than with former plantations of this most valuable and useful tree.

**Birch**.—Common native—in 8 years plants from seeds have attained a height of about 15 feet.

**Beech**.—Remarkably fine and esteemed.

**Catalpa**.—Not hardy. Trees died after 3 years.

**Chestnut**.—Doing well. There are fine trees produced from seeds taken at the Manoir des Aulnaies 12 or 13 years ago. These beautiful and hardy trees producing good nuts are not much in demand, and are not propagated in nursery on that account. Purchasers of trees want tall trees and do not succeed generally with the large chestnuts. We advise them to plant 3 year old plants twice transplanted, but they prefer to plant other trees which are less ornamental but transplant better.

**Honey Locust**.—Not hardy—freeze to the root.

**Kentucky Coffee**.—The tip of the branches freeze every year, but a row of 25 trees 4 years old continue growing.

**Linden, European**.—Hardy like the American, there is a moderate demand for this tree.

**Maple Red Colchicum**.—Above the snow level all the growth freezes.

**Maple, Negundo**.—Over 5,000 in nursery, 3 years from seed. This tree though not very ornamental is so vigorous, transplants so easily, gives shade so promptly in all soils and exposures, and is so cheap, that it is popular and the demand increases.

**Magnolia Soulangeana**.—Only variety tried and proved too tender after the 4th and 5th years. It is very unfortunate that this fine tree does not succeed.

**Oak**.—This noble tree—the white and red—does very well, is sold at 2 years old at the nursery. There is some demand for this useful and ornamental tree.

They thrive better planted amongst other trees.

**Elm**.—(*Ulmus Americana*) grows crooked on dry soil but very fine on bottom land.

*Maple*—*Acer Saccharinum*, *Sugar Maple*.—Very fine on uplands.

*Maple*—(*Acer Saccharinum* *Sugar Maple*) very rapid growth, beautiful foliage, recommended for streets and parks, much in demand.

*Silver-leaved Maple*.—A fine tree and rapid grower.

*Birch* (out leaved weeping) *Betula laciniata pendula*.—The most popular of ornamental trees, many fine specimens in nurseries and grounds, habit of growth increases in beauty with age, hardy as the common *bouleau* of the woods, the Canadian ornamental tree par excellence

*Mountain Ash*.—Grows well, a very large specimen near house in perfect health and vigour. But, by Col. Rhodes advice, this is no longer grown, since the *borers* multiplying in this afterwards attack the apple-trees.

*Willow, Kilmarnock weeping*.—Greatly to my surprise quite hardy here and much in demand, good specimens in nurseries doing well.

*Willow, Rosemary*.—Leaved not hardy—ditto "golden."

*Horse Chestnut*.—Fr. *Marronnier*—these trees have stood for years without injury and there are some elegant specimens on the place but for some reason at present unexplained a few are damaged this winter after 15 year's growth.

#### ORNAMENTAL SHRUBS :

*Berberis* (Common European) *Berberis Vulgaris*.—Very nice and hardy.

*Honeysuckle*.—Upright Tartarian, one of the best and most hardy. Blooms freely in May and June.

*Mahonia aquifolia*.—A beautiful evergreen shrub, the only shrub which is evergreen which does well.

*Spiraea prunifolia*, *Salicifolia*, *Thunbergii*.—Profuse in flowers, grow and flourish admirably.

*Weigelia rosea* and *amabilis*—Quite hardy and beautiful.

*Hydrangea grandiflora*, a very hardy shrub, with lovely bunches of flowers in September.

*Lilacs*.—All very hardy and popular.

*Privet*.—Very hardy; good in hedges.

*Snowberry* (St. Peter's wort).—Quite hardy.

*Strawberry Tree* *Euonymus*. Not hardy.

*Syringa* or *mock orange*—Splendid and perfectly hardy.

*Syringa*, *hoary leaved*.—Splendid.

*Snowball* (*Viburnum*)—Splendid.

*Viburnum lantanoides*.—Fine; beautiful for hedges.

#### VINES AND CREEPERS.

*Aristolochia*, Dutchman's pipe, (did not succeed).

*Bignonia* Trumpet Flower, (did not succeed).

*Honeysuckle* (monthly, fr grant).—Good, very popular.

*Honeysuckle* Chinese.—Not hardy.

*Ivy* (hedera)—Not hardy.

*Ivy* (American or Virginia creeper).—The most hardy and rapid in growth and most esteemed of any of the climbing vines.

*Clematis Jackmanii*.—Winter killed although protected. The beautiful *Tulip Tree*,

*Liriodendron tulipifera* is under trial but there are doubts if it will succeed.

Mr. Dupuis is not successful with roses; he thinks it is owing to the dryness of his soil.

I saw some fine rows of the now popular esculent the *Rhubarb*, the *Linnaeus* is no doubt the best, but Mr. Dupuis notices a tendency in this to run out; he is therefore raising new varieties from seed some of which are very promising.

Such is the valuable information I had the pleasure to obtain and which for the public good cannot be too widely circulated as it must aid in checking the actual damage done by the importation and sale of plants which are entirely valueless, and encouraging the proper planting of fruit and other trees.

A few remarks as to Mr. Dupuis' method of doing business, as it is the only right one, will not be out of place.

First he offers no goods but what he has proved will ripen their wood and grow well in his cold latitude—having discarded all others as worthless—his prices are very moderate, his goods as I am informed by friends who are his customers are packed very carefully for which a small charge is legitimately made, the trees are sent direct to the purchasers in the original packages—not by delivery agents as is the usual custom of tree dealers who employ salesmen, and thus the great evil of exposure of the roots to the air is avoided and the plants arrive at their final destination in perfect order.

Brief but ample directions are given in the Catalogue as to transplanting and would be purchasers had much better place their orders with him or some other Canadian Nurseryman of equal respectability and systematic business habits, than depend upon the representations and blandishments of tree agents who "go about" seeking whom they may devour.

The appointment of Mr. Dupuis as Commissioner to represent the Province at the Jamaica exhibition was a well deserved recognition of his public services—he was evidently the right man in the right place—I had the gratification of seeing many of the curious specimens of tropical products, &c., which he brought home, and am glad to learn that they are to be at the forthcoming exhibition of the Quebec Horticultural Society, as an inspection of these alone will be worth the admission fee.

I have the honor to be, Sir,

Your Obedient Servant,

(Signed) GEORGE MOORE.

In reply to our questions, M. Auguste Dupuis writes to us as follows. Although this information be entirely personal, we think its publication will interest our readers :

I thought it my duty to add the name of Mr. Fiske as a trustworthy nurseryman. He has propagated and disseminated a great number of apple-trees, originated in Canada especially in the neighbourhood of Montreal, which have proved of great value, as well as several Russian varieties. Mr. Fiske enjoyed the approval of the regretted Mr. Charles Gibb as to the experiments he made, and you must have heard what the latter said at the meeting of pomologists at Quebec in favour of Mr. Fiske's work. You will have no trouble in convincing Mr. Moore of the propriety of distinguishing this most enterprising man by marks of approval, and it would be very desirable that Mr. Moore should be requested to visit his establishment and report thereon.

Mr. Moore omitted to mention what I told him about the trees that come to us from the States and Ontario. Excellent specimens come thence, but they should never be planted in the fall in the neighbourhood of Quebec.

As to the foreign varieties of plum trees, which are imported from the States and will not stand the climate round Quebec, has it been noticed whether or no they have been grafted on the peach?

To get larger fruit, most of the American nurserymen graft the plum on the peach; this answers very well in the States, but the trees are of no use here, as the roots are utterly destroyed by the frost. For the good of the purchasers, Mr. Moore ought to have mentioned this; for those who wish to get plum-trees from the West should ask to have them grafted on the wild plum-stock, which is very hardy.

Grafts on roots, ready for delivery 1st May, 1892 :

Assorted apple-trees, \$2 the hundred—\$15 the thousand.

Plums and cherries, 3 " - 20 "

all grafted on hardy roots, and able to stand the climate. Orders must be given in November.

I beg to thank you for your kind words of encouragement.

We are engaged in the same work: you in the propagation of sound theory, and I in putting some of these theories into practice and in making experiments throughout the range of commerce. I have the honour to be, with esteem,

Yours truly, AUGUSTE DUPUIS.

N. B.—The creamery at the village of Montmagny has sent 1,000 packages of butter to the W. India Islands, in tin boxes, such as I spoke of in my report from Jamaica. The returns have been most satisfactory.

How glad I shall be if my humble report has done any good!

I am glad to say that the firm of Ira Gould, Montreal, has sent two lots of flour to Jamaica, and the agent informs me that Mr. Gould followed the instructions given in my report as to the most advantageous route, i. e., by the Atlas line, via New-York. Mr. Gould is perfectly satisfied with the first sale, the last lot sent was 1,500 barrels. It is unfortunate that the Canadian Company of Halifax asks such high prices for freight.

A. D.

(From the French.)

Massawippi, Quebec, August 19th, 1891.

ED. A. BARNARD, ESQ.,

Sec. Council of Agriculture.

Dear Sir,—I have received one of your circulars addressed to the officers of County Agriculture Soc, and having just completed a silo as near your description as circumstances would admit of, am in need of a little further information which I do not find in your circular, to wit: having built the silo for the purpose of a more profitable means of saving clover, what covering, if any is needed? The crop not being all sufficiently matured to go in at once there will probably be two weeks difference in the two fields. Also will the silage need covering while waiting for rest of the corn to mature as much as possible?

Some informations on these points will greatly oblige

Yours respectfully,

True copy.

(Signed) JAMES H. CARTER.

Quebec, 21st August 1891.

JAS. H. CARTER, ESQ., MASSAWIPPI, Q.

Dear Sir,—Many thanks for your favour of the 19th instant. Were I in your circumstances, having to wait a fortnight or so before the completing of the silo, I would put common boards on the clover—properly levelled and well-tramped—*break the joints*, by a second row of boards, again lengthwise, and put about six inches of earth on the boards. When the rest of the clover should be ready, I would as a rule just fill up, as if in a new silo, without removing that first covering of boards and earth. The advantage is the pressure given to the top of the clover, preventing a too great fermentation and consequent loss.

You might put simply tarred paper and load the same with boards and a few stones. But the compression necessary to drive out the excess of air from the upper layers of ensilage is best obtained, as suggested, with boards and earth.

Yours respectfully,

(Signed)

ED. A. BARNARD.

Chicago Exposition.

No feature of the Exposition, probably, will possess greater interest or value to the agriculturist than will the Dairy school, the holding of which substantially in accordance with the plan submitted some time ago by Chief Buchanan, is now assured. The school will include a contest between both herds and individuals of the chief breeds of dairy cattle with a view of ascertaining the respective merits of each in milk-giving and butter and cheese producing. Each herd will be

charged each day with the food consumed, accurately weighed, and will be credited with the milk, butter and cheese produced. Manufacturers of dairy utensils and appliances will gladly furnish all that will be required in their line. Accommodation will be provided so that spectators may view the processes of butter and cheese making.

The tests and all details of management will be under rules to be prepared by a committee composed of one member from each of the dairy cattle associations in the United States, three from the Columbian Dairy Association, three from the Agricultural Colleges and U. S. Experiment-Station, and one from the manufacturers of dairy utensils.

The manufacture of the products will take place in the Dairy building, in an operating space 25 by 100 feet, above which on either side will be a gallery which will accommodate fully 500 spectators. The school in all probability will continue through four months, and each participating herd will be represented by a given number of cows. The results of this test and of the exhibition which will be made of the latest and most advanced scientific methods known in connection with the feeding and care of cattle, the treatment of milk and the production of butter and cheese, cannot fail to be of very great value to the dairy interests of this country. These interests, it is scarcely necessary to state, are of enormous importance and extent and, indeed, are scarcely surpassed by any other branch of industry in respect of the amount of money invested. It cannot be doubted that the Exposition Dairy School will cause a more economic and scientific management of the dairy interests of the entire country and consequently a greater return from the capital and labor invested.

Chicago, Aug. 17.

#### ENSILAGE.

REMARKS ON THE WORK OF THE EXPERIMENT STATION  
BY M. L. ABBÉ CHOQUETTE. (SOREL)

Mr. President and Gentlemen:—

I am not going to lay a lecture before you this evening; I am only about to present to you the first report of the experiment station of the Province of Quebec, and to add a few words, a few notes, which time failed me to insert in it.

The question of ensilage, you will not be surprised to hear, has occupied most of my time during the past year. As you all know, this question is one of the greatest importance. It forms the subject of daily conversation among the farming class, and it has been placed by our legislators among the questions that are worthy of occupying their attention.

Other lecturers will talk to you about the silo; how to build it, how to grow maize with which to fill it, and the value of this food. For me, I shall only consider one part of the question this evening; I shall address you shortly on the technical side of the question. Don't be afraid: I won't weary your ears with dissertations on chemistry or bacteriology. I shall only describe to you what passes during the particular case of the fermentation of the maize.

The question is not a trifling one. It is quite true that the world existed for many years without understanding the nature of beer-yeast, any more than it understood the wine-ferment. But to-day, people want to know everything; and he who has succeeded in discovering one of the secrets of nature, or one of those curious phenomena of fermentation, must be excused if he imparts his discovery to those by whom he is surrounded.

Ensilage has been called a *conserve*: the word is pretty correct, it has been properly applied, in this sense, that, first, it is a word well understood, and next that it designates a manufactured article. For this reason I think it ought to be retained. Still it is not quite correct, for ensilage is not a

thing in a preserved state; it is not a fruit preserved in a closed vessel, in an antiseptic medium; it is a substance in a state of decomposition, and the decomposition is even active.

A great heat develops itself from the very first beginning of its fermentation, as all those know who have filled silos. In the beginning, the heat rises to 150° F. Combustion is then present, fire is present, and in studying this phenomenon, the first question we ought to ask ourselves is: what is the stoker, what is the combustible?

The stoker's name is legion; there are indeed millions of them. They are those little microscopic organisms that play so great a part in the operations of nature, and which physicians call to their aid as often as they have to define or to treat a new kind of disease.

The farmer is always at war with these tiny organisms. They it is which by their development turn milk sour, make butter rancid. They devour his crops, his fruit, his meat. They feed on his bread, and intoxicate themselves with his beer and his wine.

But man is more powerful than these organisms, and once upon a time man learned how to catch them, and to enclose them in a confined space in which he forces them to work for him night and day: this is the operation of ensilage.

The farmer encloses in his silo three *genera* of organisms that go to work with more or less activity. First of all there are the ferments, yeasts; then a whole class called *bacteria*; and lastly the moulds or mildews. Among the ferments there is one that plays a distinct part. It will only work under exceptional conditions of temperature and moisture, on very clean, properly selected materials, on sugars carefully prepared.

In certain quarters, people would like to see it work with greater activity. Unfortunately, it remains inactive in the silo: this is the alcoholic ferment the one that produces alcohol, more generally known by the name of *whiskey*.

But in the silo the alcoholic ferment is, so to speak, annoyed at finding itself in contact with the humble *bacteria* and mould or mildew, and it won't work. It will hardly do enough to keep itself alive. And this is why only traces of alcohol are found in the silo: sweet or alcoholic silage is rather a curiosity of the laboratory than an industrial product.

It is not the same with its companions: the bacteria and the moulds or mildew. They are less difficult to please, and more hardy. As soon as the heat that has developed itself begins to subside, these germs set to work. They begin at the top of the silo and in a few weeks they will have pervaded the whole mass to such a degree, that five or six weeks after your silo is closed the maize is as if penetrated by these corpuscles, these organisms, and each particle of maize has become the habitation of a number of these bacteria very easily visible through the microscope, and which I hope to show you some day.

At this point the ensilage question becomes a practical one. If the silo is well built, well closed, if the mass has been well trodden at the corners and sides, don't be afraid; of the ferments I have been speaking about only two kinds will remain; the one that produces vinegar and the one that sours milk. They will remain as long as the heat is about 100° F. and the air has not penetrated the mass. After six and even twelve months, you will still find these two ferments at work side by side: the acetic, the one producing vinegar, being the more numerous, but both living together in the most friendly manner.

But if the silo be open, if the air gets into it in quantities, then the two ferments will work at an enormous pace, and in a few days they will have lived their lives. Then, in their place, you will find another ferment, not nearly as desirable, that is called the *rancid butter ferment*, and your ensilage will be spoiled. It will impart a disagreeable, characteristic

odour that every body who has been unfortunate enough to lose in this way a large quantity of ensilage will easily recognise.

There you have enough, in a few simple words, to make you familiarly acquainted with this subject, since this question of ensilage is greatly the fashion of the day. I have described to you the phenomena of the fermentation of maize in its conversion into ensilage. It is quite simply the product of the well managed activity of two ferments, the one that produces vinegar, and the one that sours milk; but the former, as I said, exists in far greater quantity than the latter, and in well managed silage gives off the pleasant smell of vinegar.

It is surprising that in our researches into the secret of economy, for the preparation of cheap green-meat, we should not have hit upon the plan earlier; since, for years the Germans have prepared their national dish, the celebrated "sauerkraut," by the same means that we are now preparing green silage. Sauerkraut is only cabbage fermented in a silo smaller than the usual one, but still a little silo, and the maize-silage is simply fermented maize.

I said moreover, that there exists in the silo both fermentation and combustion. Consequently there is a loss. You must not be surprised at this; you will first admit that these ferments I have mentioned, living in a nutritious medium, will begin by providing for their own wants and then part of the silage will be used up (*consommé*) or if you prefer the word, *consumed*, since I have compared fermentation to combustion.

In every product of fermentation, whether it be beer, wine, alcohol, etc., there is invariably a loss. The housewife, for example, who watches with an attentive, interested eye the dough she has just kneaded; who stands by while the silent action of the yeast raises that dough, destined to become bread, can easily verify for herself the existence of innumerable eyes that form at its surface. They are so many little chimneys through which escapes the product of the interior combustion developed by the yeast. These gases which thus rise through the eyes of the dough lose themselves in the air, and diminish by so much the quantity of solid material that was kneaded. And so it is in the silo; as soon as fermentation begins, combustion sets in; and in the silo gases are produced, which disengage themselves and become dissipated in the atmosphere.

"But," you will ask me, "is this loss considerable? For, after all, when we have at a great expense got a lot of maize into our silo we don't care to lose any of it."—Well, you will have to lose part of it. There is really a loss, and in the samples that I have analysed of green maize and of ensiled maize. I have proved the loss to be between ten and twenty-four per cent. *par une première observation*. In this case, a ton of maize ensiled, would only give 1,500 lbs of fermented silage. The calculation is difficult to prove, but I think I can give you an idea of the process I have followed.

You know that in maize, as well as in all plants, there is a mineral part that constitutes the ash. There is no danger of these mineral elements being attacked, destroyed or modified in any way by the action of the ferments. Now, in weighing the ash of 100 lbs of maize and that of an equal quantity of ensilage prepared from the same kind of maize, I find that this ash has increased during the fermentation, in the ratio of 100 to 124. That is, that I have got from 100 lbs. of silage the same weight of ash that 124 lbs. of fresh maize would have given me. I conclude then that the carbohydrates and the albuminoids of these 24 lbs. of maize have been burnt during the fermentation. This process is not absolutely correct, but it is sufficiently so. (1)

(1) A very clear and concise illustration.

This real loss of 24 % is compensated by the *plus* value acquired by the silage. We know that fermented dough is more digestible and nutritious than unfermented dough. Similarly, we believe that fermented maize is more digestible than unfermented maize. What we thus lose in quantity we gain in quality.

There is also another cause of loss in silage, beside that developed by the fermentation: it is the loss caused by the maize being packed into silo before it has attained sufficient maturity. When the elements that are called carbo-hydrates and protein are young and tender they decompose more easily, and therefore the maize which, not having attained a sufficient stage of ripeness, is watery, will from this cause undergo considerable loss. Whence we conclude, that it is important and even necessary to cultivate maize at wide intervals.

You will find in the report, there are copies of it on the table, which I have brought here for distribution among you all—you will find, I say that many samples brought to the station for analysis were planted at 24 and even 18 inches between the rows. Well, these samples have relatively, but a poor nutritive value: \$2 a ton, sometimes less; very few exceed this sum; while the samples of silage sown at 36 to 42 inches give a maize of superior quality, the nutritive value of which amounts to from \$2.92 to \$3 a ton. The difference you see is considerable.

Besides, gentlemen, I believe that we are the only people among those who make silage, that sow maize at such narrow intervals. I have had occasion to read the works published on this subject in the United States, in Europe, and even the report of the experiment station in Germany, and I nowhere find that maize is cultivated in rows nearer together than 36 inches, and in some cases I see that it has been sown at 42 inches.

This, doubtless, will surprise many of you, for it seems to be one of our habits to sow at narrow intervals. Well, the farmers of Quebec, especially the members of the Dairymen's Association, who have contributed to the making such a practical success of silage by recommending the construction of wooden siloes at a very reasonable cost; the farmers of this province, I say, must not remain in the rear on this point. I repeat it, the value of ensilage prepared from maize sown at intervals relatively narrow, is from 15, 20, and even 40 % less than that from maize sown at wider intervals.

But, it will be said: if the nutritive value of thick-sown maize is less, the quantity grown is greater. I hope to be able to prove that this is not the case. I had sown in experiment-fields different kinds of maize at intervals of from 20 to 36 and 42 inches. Here are samples of that maize thus grown and harvested at 20, 30, 36, and 42 inches. I weighed exactly the quantity given by each superficies of land of the same soil, and it will be easy to prove the real quantity of nutritive matter yielded by equal parts of maize planted at the different distances.

To-morrow you will be addressed on the construction of the silo, on the manner of building siloes, and on other important details.

I will add a few words in explanation of the notes in the report, particularly on the subject of chemical fertilisers. A great deal is being said nowadays about these manures. I must confess that at present they are rather costly, particularly what are called "complete fertilisers, *i. e.* those containing phosphoric acid, potash, and nitrogen. Phosphoric acid in plain superphosphate is rather more reasonable. But the use of phosphates is not arbitrary, that is, phosphates are not suited to all kinds of land. We must know beforehand what I may call the appetite of the soil; that is to be learned by sowing on different crops different quantities of known chemical manures; but this should be done on a small scale, so

as to make experiments, for example, on some hundreds of feet of land.

I intend to make arrangements with Messrs. Nicholls, of Capelton and let them to send some of your samples of chemical manures, or complete manures, that you may experiment with on your own farm. If you will kindly make an exact report of their effects, we shall be able to give some useful information to enquirers.

The chemical analysis of soils, it is true, may be productive of good results; but the process is long and difficult, and for my part, I do not intend to make a great number of them a year.

And now for a few words on milk and its analysis. All our lecturers unanimously deplore the vile custom among our farmer-patrons of adulterating the milk either by watering or skimming it. The tests applied by the inspectors succeed now and then, but sometimes chemical analysis becomes necessary. I was convinced of this by the sight of certain samples of milk brought to me this summer by some cheese makers. It happens that these samples are not always in good order; the bottles are not clean, the corks are old, and all these defects are apt to make the analysis of doubtful correctness.

With a view to saving you from troublesome proceedings, and to facilitate the analyses, I will ask you to provide bottles like this one, enclosed in a case, so that it can be forwarded by post. Each bottle will be accompanied by a note, the instructions of which I hope you will follow carefully. I will undertake to place, in each bottle, an antiseptic to preserve the milk from decomposition. If you observe the directions exactly, particularly that of filling the bottle *just up to the mark*, there will be no trouble in arriving at the percentage of butter, even if the sample do not reach me before the next day or the next but one.

I will make these analyses gratuitously, in the hopes of doing a service not only to the makers, but to the patrons as well. When the latter see that their frauds can be detected, they will become more prudent and less dishonest. So, in this way, I shall have contributed my share of beneficial service to your industry.

Those reports on the table are for gratuitous distribution; and if any of you in the course of the year desire to obtain a copy, you have only to write to my office, or to the Department of Agriculture at Quebec.

THE PRESIDENT—Is not an apparatus for chemical analysis rather expensive?

M. L'ABBÉ CHOQUETTE.—There are several sorts. I was in hopes of being able to bring you one here that is simple enough, but the experiments I have been making to regulate its action have not proved satisfactory. This is often the trouble with this sort of apparatus: one day the indication will be correct, the next it will erroneous.

This bottle is not an apparatus for analysis-making; it is only a means of easily transmitting the samples of milk, and cannot cost more than fifty cents. I hope that there will be this spring, several of them for sale at the Secretary of the Association's office.

M. T. C. CARTIER—Will the soil feel the effects of chemical fertilisers for more than one year.

M. L'ABBÉ CHOQUETTE.—If it is not too worn out, it will feel the effect for two and even three years.

M. CARTIER—I used a phosphate from Smith's Falls on light land in the Townships, I found it answer, but I should like the soil to remember it; it cost \$35 a ton. (1)

M. CHOQUETTE—The chemical manures are very dear,

(1) Bone-dust will last longer than any other manure.

but we trust that, when the demand increases, the price will be lowered, especially when we consider that we have in the province an establishment where the raw material is prepared. But, as I said just now these manures must be used with great judgment.

M. L'ABBÉ CÔTÉ—They are sometimes adulterated.

M. CHOQUETTE—I beg for the attention of the meeting on this point: the Ottawa government has a special office to which you have the right to send samples of chemical manured for analysis, provided you take the sample sent before a witness. If the Ottawa people are too busy to make the analysis, I will do it. You will see in the report that I have analysed all the chemical manures sent out by the Capelton firm, and that out of six brands sent out for sale, five answer to the guaranteed contents barring a very trifling difference.

M. CARTIER—They are of no use on heavy land, are they? (1)

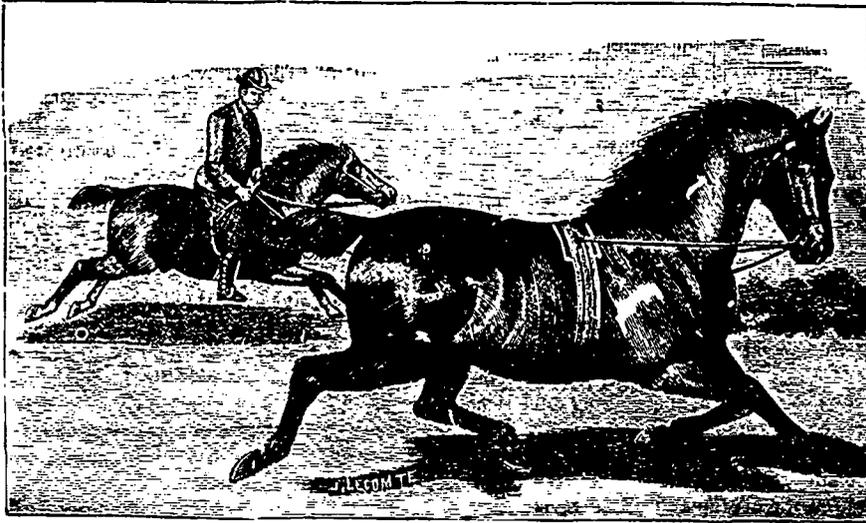
M. CHOQUETTE—We cannot say that as a general thing. In the spring, I intend to prepare small parcels of chemical manures of, say, ten pounds weight, and to send them to cer-

## ADDRESS OF MONSIGNOR LABELLE.

ASSISTANT COMMISSIONER OF AGRICULTURE AND PUBLIC WORKS. (SOREL)

*Mr. President and Gentlemen,*—I must speak to you of the dairy industry and of agriculture at the same time, for the two subjects are intimately connected. I like talking about farming very much; but I am not theoretically and practically a master of that art as is Mr. Beaubien. You see I am nothing but a poor country curé who has never farmed, who has never held the stilts of the plough. I studied agriculture, because I was in the habit of constantly seeing farmers, and besides, on account of certain thoughts that used from time to time to pass across my mind.

I felt that our forefathers, possessing a virgin soil full of the unexhausted riches of its original fertility, had been the spoiled children of Nature. Where a soil is new, you know that it will grow anything you want, and all you have to do is to tear up its bosom a little. So that the soil is more



ENGLISH HACKNEY STALLION, MIRFIELD SENSATION.

tain districts where we think the land is nearly homogeneous in composition, and the effect that they are shown to have on these soils will be, I think, the same that may be expected from them on a more extensive scale.

M. L'ABBÉ CÔTÉ—M. Choquette analysed two samples of milk in my parish and found them both adulterated. Punishment fell on those who were found guilty, for they were both found guilty, and fined, and so convinced were they that their fraud had been found out, that they never attempted to resist the decision. One was fined \$7 for putting a little water into his milk, and the other \$35. The effect, too, was felt at once, for the maker immediately found that it took rather less milk to the pound of cheese. The difference was not great, but at any rate it took two or three-tenths of a pound less to the pound of cheese. And I think that in future we may feel perfectly confident that these experiments (tests) are quite exact, for those on whose head the bolt fell were so convinced that their villany had been discovered, that they hid their faces, and paid the fines without a word.

Well, I hope that those who want analyses made will send to M. Choquette in perfect confidence of the result, for I can assure you that in our case the success was complete.

(1) Just as good as on light land, if properly used. A. R. J. F.

crafty than its master. (Laughter). But to-day the time has come when the master must be more crafty than the soil. (Laughter).

And this is the reason we are making efforts to impart sound and wise agricultural information. It takes time, I know, but with courage, with the assistance of all well-wishers to their country, farming in Canada will become a profitable trade. And, then, we shall see farmers more attached to their calling; for as it has been well expressed: when a calling is remunerative, people like it.

I found, when I was studying agriculture, that manure was, so to speak, the basis of good farming. The soil was impoverished: there was no system of rotation. Well, I preached, aye, even from the pulpit, that plenty of cattle must be kept to make plenty of butter and cheese, and in order to have plenty of manure.

Fancy that, once upon a time, one of my parish-farmers, being at the Montreal market, was asked how I was, what I was doing: "My curé," replied he; "he is up to his neck in manure." (Laughter.) Well, when I heard of this, I was proud of it; it showed that manure was necessary, as I had it up to my throat. (Laughter.)

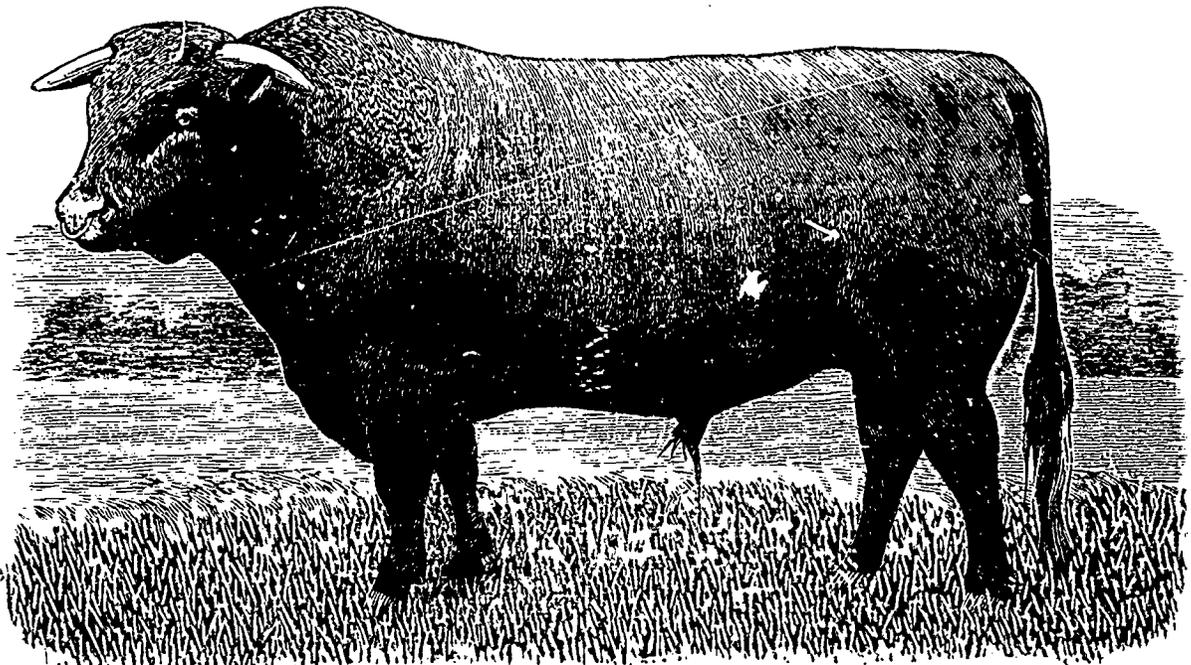
But that is not all; to get the land well worked, I advised

my farmers to put in potatoes, because with the implements we now have, it is easy to cultivate them. For at the beginning of improved systems we must not attempt too difficult things; we must ascend gradually. To have good crops of vegetables the land must be well hoed, and I found that this would more easily be done when potatoes were the crop, and with greater profit, without mentioning other sorts of vegetables; for you know that suburban proprietors make more money out of vegetables than those who are at a distance from towns. But what happened? First came that hateful potato beetle; my plans were pretty thoroughly floored! (Laughter.) All at once, a poison was discovered to kill those horrid brutes; then I announced, from the pulpit, my first great victory over the potato-beetle. (Laughter.) But just imagine what opposition I encountered! There was a man who, at the very door of the church, exclaimed, that people must not pay attention to me, because Paris-green would poison all the cattle, that in the parish of St. Augustin, a man had

oh, the instructions I gave him about it! I did not quite tell him to get a cradle for it, but very nearly. (Laughter.)

The calf grew up, then I said: He who reared this animal ought to derive some little profit from it to pay for his trouble; the price charged for the service was fifty cents; that was not enough to ruin a man. But only think, she would not breed! What is to be done! said I. Anyhow, this fine breed of cows must be distributed around the North. I bought four cows, and gave away, here and there, every calf they had. Go and visit the North now, and you will see lots of them. They are capital cows. Thus, in this way, I did all that lay in my power. To-day, you know, when people talk of these cows, they say: "These are Curó Labello's cows." They have my brand on their foreheads. (Laughter.)

But something occurred, gentlemen, which gave a great impulse to the progress of agriculture; this was the establishment of the Dairymen's Association, of which M. Bernatchez is the president, and of which you see so many members met



DEVON BULL, DUKE OF POUND 16TH.

THE PROPERTY OF MR. A. C. SKINNER, POUND FARM, BISHOP'S LYDIARD.

WINNER OF FIRST PRIZE AT THE DEVON COUNTY SOCIETY'S SHOW AT EXMOUTH, AND OTHER PRIZES.

sprinkled his potatoes with Paris-green; a storm came on; the rain ran into the ditches charged with Paris-green; his cattle had drunk of this water; and they were all dead. This tale went from house to house. It was all a lie; it was the man's sense alone, that was dead; but I was to some extent its victim.

I relate this partly to show you the difficulties we meet with in introducing improvements. But we must never be discouraged. I wanted to introduce into the North a breed of cattle, which is very hardy; good butter-makers, cows that give 8 or 9 pounds of butter a week for many weeks. These cows, I have seen; 3 or 4 years ago, they asked from \$80 to \$100 a piece for them. They tested them by skimming their milk, for their price depended upon the quantity of butter they gave. Well, only fancy! some one gave me a calf of this breed. Ah! I loved it as if it had been my own child! (Laughter.) What do you think this calf was worth? \$200. I gave it in charge to a farmer, telling him to take great care of it. And,

here to-day. You can form no idea of the good that this has done. Seeing M. Taché present, I cannot refrain from offering him my grateful thanks for the zeal he has shown in this respect. His talents are, indeed, very remarkable; he has devoted all his intelligence, all his acquirements, to the important question of the dairy industry. We cannot do less, gentlemen, that thank him for it.

You know that to get a good flow of milk from the cow's udder, a good lot of food must go into her mouth. This law admits of no exception, and unfortunately, we are in the habit of feeding our cows insufficiently: we do not value them highly enough; we do not know what profit they are able to afford us. Nowadays, all the markets of the world have been altered by steamers and railways; it follows, then, that our farming must be altered if it is to be made more profitable. If the man that sows an acre in oats, reckons up the whole cost of the seeding and harvesting of this crop, all the food and labor it has consumed, I think, he will find that he has

not made \$1 a day, there are laborers who earn more than that. We must, it is true, as much as possible draw from the land all that is required by the family and the farm-stock; that is the great secret.

The chief thing to know to-day is how to feed our cows, so that they shall give plenty of milk, and that milk of rich quality. My opinion is, that the system of ensilage lauded so highly by M. Beaubien, is the gift of Heaven to Canada. We, who used to feed our cows on straw alone, are going to give them wine through the medium of the silo. For silage, gentlemen, is like the juice of the grape, which, after fermentation, becomes wine, which is preserved in bottles for an indefinite period, and is drunk with so much pleasure. In silage, in consequence of the fermentation that takes place, it is as if maize became wine, because the sugar found in the maize is converted into alcohol, just as is the case with the sugar of the grape. Silage, is almost as valuable as the best pasture-grass. I feel that it is a present made to us by Heaven out of consideration for the length of our winters. In France, I observed that the climate was not so propitious for making good silage as ours is; the first experiments made there were not successful.

But, here, a silo is a matter of no consequence, as far as labour goes; we have only to tramp down the maize, even without chaffing it, though it is better to chaff it; we have as much as we care to make use of all the winter, as soon as we have tramped it and prevented the air from getting into it. It is easy enough. I made a silo at home for an example to my people. I do not keep many cattle, but it is all the same, said I to myself, I must set the example. But one thing I had to contend with—the rats. I fancy I shall have to make a brick floor to my silo, for the rats poke themselves in everywhere. (Laughter.) I have been advised to fill up the bottom with broken glass: if this does not answer, I shall put in a brick floor.

We have now, then, siloes, and I hope they will multiply quickly all over the province; even if I have the trouble to advise the government to give those who build them a small bonus, to reward them for being sharper than their neighbours. (Laughter.)

Now, let us talk about butter and cheese. We have markets that are already open to us, and markets that are going to be opened. One great point is: to make good butter. And I wish that all the members of the Dairymen's Association, my dear friends, would look to it that their butter be always No. 1, and their cheese, too, No. 1; even if they have to combine together to sell their butter and cheese, so that no bad tubs could creep in, here and there, throwing discredit on the butter of intelligent people, who make and sell nothing but good butter.

We must learn how to pack our butter; and I think we shall at last have a system so perfect, that our butter will reach England as fresh and as finely flavoured as it was when it left Canada. As to cheese, that is easy enough, it has a thick rind that protects it during the voyage. But the butter is not so easily guarded.

I remarked, in Europe, that butter was sent to the West Indies and Brazil in small tin boxes: in those places butter is very dear. We must study this way of packing and try to enter into commercial intercourse with the West Indies and Brazil, taking care to preserve the butter fresh, i. e., to keep it from all contact with the air. Closed in boxes, as above, it will have retained all its freshness and flavour when it reaches those regions.

You see all that can be got from your cows. It is incredible! Our cows are our fortune, and it is they that give us honey on the earth. Our country is a fine country, remember, *amis*: I was reading Josephus, the historian of

the Jews, in that part where he describes the country that God gave to the Jews, a country flowing with milk and honey. Well, remember that Judea, after the description of Josephus, is like our own country: it abounds in mountains in fine forests, and in streams. I thought within myself that we were as fortunate as the Jews, and that God chose this land of Canada expressly for us, as he chose Judea for the Hebrews.

"But in your country," said some one to me, "you have no olive oil." I felt a little bothered; but I replied: "No, we have something quite as good, though the Jews had no maple syrup!" (Laughter.)

Well! In a country like ours, so fit for cultivation, with the sea so near, that is, so to speak, on the very borders of the sea, do you not think that its people can make that country one of the richest and most prosperous of all lands? Most decidedly, I think so; if we desire it there will be no country on earth more blessed than Canada, since we shall all have, as M. Beaubien says, siloes on our farms. It does not take much to revive agriculture, does it? Only a silo! As I said before, I regard the silo in Canada, as a present from above, sent at the right time to make us in love with agriculture. For by means of ensilage, we can cause a herd of cows to give the most copious possible yield of milk.

The Pères d'Arundel (who belong to the order that has established one of the finest farms in France, at St. Laurent sur-Sèvres,) have built a silo on their farm. The father who directs that establishment said to me: "My cows have given milk all the winter, except for a month before calving, and when they calved, they were fat enough for beef, and this after having made butter all the winter." I asked him: "How much do you think you have made by your cows during the entire winter?" He replied: "Counting the pigs I fattened, I believe the return from each cow was \$40."

Allow, then, now, \$40 a cow; a man who keeps 10 cows, and who feeds them well on silage would make \$400, and he who has 20, would make \$800. Suppose he keeps this money to swell about with (*faire le Monsieur*), would not the rest of his income from his farm keep his family? A farmer with \$400 is comfortably off. And to this add a colt every year for M. Beaubien has imported horses of the first class from France, and is going to let us use them for nothing.....well, for next to nothing. (Laughter.)

We are going to renew our breed of horses by crossing them with the best stallions from France. I have seen M. Beaubien's *haras*, and I was astonished at the beauty of the horses. I hope he will be repaid, and that we shall recompense him for having brought into the country horses so handsome, so healthy, and so powerful.

You will excuse me for having spoken so long. I congratulate you on having come in such numbers to this meeting, and I trust you will continue each year to meet together, and be zealous in paying your dollar; more zealous than I, for last year I was not here, and I didn't pay my subscription, so this year I will send two dollars, *en revanche*. Pay your dollar, then, and in ten years you will see that we shall have obtained the grandest results. I won't talk to you about my plans for agricultural schools, that must be for another year. I must not say all at once.

M. BEAUBIEN—We must always take the ball at the hop. I would propose that M. Labelle kindly carry out his idea of insuring the construction of a silo in every parish. He told us he intended to gain this result by offering a prize. I see that a committee of the House has been appointed for this object, at least, this is one of the principal ends it intends to secure: the construction of a silo in every parish. I believe Monsieur to be good enough to make use of the influence he has with the members of the House, to realise this project.

of prizes in favor of those who shall build siloes in every parish, and that the prizes shall be distributed by the parish priest. In this case I shall deserve the title of the father of the silo. I don't deserve the title yet, but it has been conferred upon me and I accept it.

**THE PRESIDENT**—Allow me to thank Monsignore for having come, and for having honored us with his presence this evening. He is always welcome. Not only has he interested and enlivened us, but he has given us advice which ought to be followed.

His presence here has a double advantage. As he is possessed of much influence with the government, we hope he will greatly aid our association by obtaining for us the sums necessary to encourage those measures that we patronise in the different lectures that are delivered at our meetings. I thank him once more for having put himself so far out of the way to attend our convention.

#### Questions on Ensilage.

1. As regards tarred paper between the panelling of siloes, the only objection I can see to double panels both inside and outside with paper between, that is to say, four boards and two papers, is the expense. Nothing can be more perfect than a silo thus made, but the ossing would cost more than double than if it were made of two panels of ordinary boards with earth between them.

2. As to the size of an experimental silo, to hold half-an-acre of maize. The silo must be large enough to allow of the fermentation being fully developed. As to the results to be arrived at by your experiment, follow the instructions already given and don't be afraid; you cannot help succeeding. As you are building a silo, make it at once in accordance with the best plans, i. e., at least 10 x 10 x 10 feet, inside measurement. In this silo you can put whatever green-fodder you have, thus filling it up to one-fourth, one-half, or three-fourths, and success will be assured, never mind what the depth of the silage may be, since the fermentation will proceed in a regular way. On a smaller scale, success may attend your work, but more care must be exercised in managing the fermentation.

The Hon. G. H. Joly de Lotbinière, President of the Council of Agriculture, will, doubtless, have much pleasure in sending a miniature model of a silo to the first farmer in the different counties of the province who shall ask for one.

**ED. A. BARNARD,**  
Seco. Council of Agriculture, and Director  
of the *Journals of Agriculture,*  
(From the French.)

#### Grass After Corn.

A dairyman who understands the business wants an abundance of excellent food for his cows the year round. Corn ensilage of the right quality gives him summer feed as well as ensilage for fall, winter and spring use. But as corn ensilage, even at its best, is not a complete food,—one which fed alone gives strength to the animal and full returns in milk without loss of flesh,—plenty of grass of the most nutritious kind is naturally sought for.

In order to obtain quickly grass after corn, several writers now suggest to sow grass seed at the last working of the horse-hoes in the corn. There are several objections to this practice. 1. The land occupied by corn does not lie in that smooth condition best suited to a meadow. 2. Water furrows, so necessary for the safety and proper duration of meadows,

are not needed to the same extent and therefore not attempted in the corn field, which only occupies the land during the hot and dry summer months; 3. Young grass needs a full hold of the land for at least a few months in the fall, in order to become well rooted so as to bridge over the danger of a first wintering. The time left after an ensilage crop is too short for such purpose and a full crop of corn shades the young grass too much to give its roots the hold and strength it needs.

Having had to solve, for myself, many years ago, this problem of early and abundant grass after ensilage, excellent results have been obtained from the following practice: thorough fall ploughing is given to the soil as soon as possible after the ensilage crop is carried away. Should the soil contain weeds, and it generally does, the field is gone over without any loss of time, with the disc harrow, or any other efficient implement in order to form a seed bed and to bring to a quick germination such weed-seeds as remain. The ploughing can be commenced some 12 or 15 days after the disc harrow has made its seed bed, as the seeds by that time may mostly all be germinated and destroyed.

We aim at thorough drainage, and in our climate of heavy rains and snow, water furrows and open ditches prove useful even with the best under-drainage.

In the spring, as soon as the fall ploughing is sufficiently dry to harrow, we sow thickly, four bushels per acre, of such grain and pulse as will give the largest return in green feed at the lowest cost for seed. Oats, pease and tares are generally preferred, but rye, barley, even wheat could be added to the mixture, as the greater the variety the heavier the return in green feed and also the more appetising to stock. An abundance of grass-seed is also sown before the last harrowing and when necessary the field is heavily rolled.

As a rule, we begin cutting for feed six weeks after seeding and the field is completely cleared before nine weeks have elapsed from the time of seeding. Thus the grass takes a firm hold of the rich meadow soil and, as a rule, gives us a heavy cutting of grass early in September. As this is carried to the cows, the manure-distributor puts on a reasonable coat of muck from the cellar of the cow-stables and the grass takes another immediate start and fully covers the meadows before our early frosts come.

I have found that old meadows which have received a coating of cow manure immediately after the second cutting,—we cut all our meadows twice, for summer- and fall-food,—give us the earliest cutting in the spring, even several days in advance of the best clover fields.

We can safely recommend the above practices to all dairy-men who wish to obtain the largest returns of milk during the summer and fall months. With us the addition of 2 or 3 lbs. of purchased feed such as 1. Dry blood 2. Cotton seed meal 3. barley germs 4. genuine wheat-bran is a great economy. The milk is undoubtedly made richer and more abundant—and so is the manure, of which no particle is allowed to go to waste.

**ED. A. BARNARD.**

#### Siloes and Ensilage.

The following questions, addressed to *Le Journal d'agriculture*, will be of interest to all those intending to make ensilage.

**1st Question.**—Is it absolutely necessary to cut maize into chaff before ensiling it?

**Answer.**—Maize can be very well managed in the silo without a chaff cutter. It is of importance to know this, seeing that the cost of a good implement, about \$30.00, is an expense that many of our farmers should be disinclined to

encounter unless they were insured beforehand of making a great profit by such an outlay.

I am convinced of the utility of the chaff-cutter, not only for ensilage, but for the preparation of all dry fodder. It has been proved to economize at least one-third of the fodder consumed on the farm. As regards ensilage, the implement saves space, since chaffed maize takes up less room than unchaffed maize.

I have, however, seen unchaffed silage that was very good. In order to succeed, the armfuls must be laid close together, so as to leave as little space as possible between them. As soon as the first armfuls have covered the floor of the silo, the spaces between them must be filled up with a few stalks of maize well packed in. This done, a second layer is to be made, always in the same direction, but this time, by laying the heads of the stalks on the feet of the previous armfuls, and so on throughout the whole depth. Observe that the armfuls must not be tied, because the ties would cause vacancies that it would be impossible to fill up.

Many large farmers in the States prefer this mode of ensilage on account of the ease with which the silage can be fed out, and because the silo can be more rapidly filled in this way. When emptying the silo, the mass can be cut out in armfuls about 18 inches long.

*2nd Question.*—Must the vacancy between the two panels of the silo be filled up, and with what?

*Answer.*—It is better to fill it up, and I prefer, for that purpose, dry-earth to sawdust, and for the following reasons: 1. There will be no fermentation therein; 2. The wind, blowing through the chaffs in the paneling, causes vacant spaces in sawdust but has no effect on the earth; 3. Earth is always to be had, but sawdust is sometimes difficult to get.

As to leaving a vacuum, it must be certain that no air can pass into the silo at any time, for it would assuredly spoil the silage. Now, the least cleft, in the outer panel particularly, would let air pass into the silage and cause great injury to it.

*3rd Question.*—When is maize fit to be ensiled?

*Answer.*—The maize is fit for ensilage as soon as all the grains are formed, but before they harden. At this point, the seed is covered with a glaze, and is very glossy in appearance. The plant then contains its maximum of nutriment. Cut before this point, there will be much less nutriment in the maize; cut later, the plant becomes hard, and the cattle derive less benefit from it. This is positively the case. The best results can only be expected, in our climate, from those kinds of maize that are sufficiently early; and, again, they must be cultivated with great care to enable them to obtain their greatest possible development during our short summers. To this end, the land must be perfectly drained, warm, and kept mellow, full of manure, and, above all, free from weeds. At all events, cut the maize before the hard frosts come. Slight frosts do not injure the plant much, so long as the stalks can continue to make growth.

*4th Question.*—Which maize is the most profitable for silage in this province?

*Answer.*—As long as people prefer great plants full of water to middling plants full of nutritious juices, all the good results to be obtained from ensilage will not be secured. We have already said that, as a general rule, the farmer will give himself the unnecessary trouble of bundling and carrying about six different times twice the necessary weight, as often as ensilage maize is in too green a state, on account of the immense quantity of water and of indigestible matter it contains. 1. in cutting the maize, 2. in loading it, 3. in unloading it; 4. in ensiling it, 5. in taking out of the silo; 6. in giving it to the cattle. Without reckoning that the size of the silo must be doubled if this green maize is to be used.

It is positively certain that one ton of good maize,

thoroughly well grown as above (till the ears are glazed), will give as much nutriment as two tons of the great American maize, the ears of which are hardly formed.

In reply, then, to the questions, I say: select from those sorts of maize that are generally accustomed to ripen in this province that which produces the greatest bulk of stalks and leaves; cultivate it carefully so as to hasten the development of the entire plant, and although the selected kind may not ripen thoroughly in your district, if the season there is not so favourable as it is in other parts of the province, still, take that kind for use, provided it arrive at the necessary point of forming completely the grain on the cob, that is, that the grain shall have quitted the milky state, and be firm (*en pâte*) but not hard.

ED. A. BARNARD.

(From the French.)

## OUR ENGRAVINGS.

*English Hackney-Stallion.*—Please observe how close to the ground he is, and what far-stretching action of the fore-legs, the hind-legs being well under him, he displays. The quarters, too, are remarkable, and perhaps the only fault he has is that the back is rather too level to carry a saddle well. But that, I suspect, is a fault in the designer.

*Devon Bull.*—Almost all of this magnificent "butcher's beast's" meat is situated on the prime parts. No wonder the breed is such a favourite on the London market. Loin, ribs, rump, and rounds are all full of flesh. A. R. J. F.

## HOED CROPS.

NOTES: BY M. SÉRAPHIN GUÈVREMONT.

*Mr. President and Gentlemen.*—As a farmer living in the City of Sorci, our farm itself being actually within the limits of the said city; I say "our" farm, because it is worked in common by one of my brothers and myself; on such an occasion as the assembling of a convention so full of interest to all agriculturists, I thought it would not be out of the way to address the meeting for a few minutes on our course of cropping; in order to show the audience the advantage of it, and to induce other farmers to adopt the system of cultivation I am about to describe to you.

I am going to speak to you about hoed-crops; at the same time, I hope to prove to you that it is a profitable system of farming. And to that end I intend to lay before you, in detail, a full account of our business.

It is not my intention to enlarge on the manner of preparing the land, any more than to describe the proper way of treating the different plants that are grown; that, I think, has been already sufficiently discussed, as well in the former conventions of this association, as in the agricultural journals. But, I repeat, it is with a view to induce farmers in general to take to the growing of these crops—and I think that is the most important point of all—that I am about to describe our successful campaigns of the last three seasons. If I say this, it is because I myself was rather incredulous about it, and hesitated about its adoption. Nevertheless, after having seen, in 1884, on the farm of the, at present defunct, Lincoln College (at Sorci), then under the management of Mr. JEROME FUST, several arpents of root-crops, such as mangels, white carrots, swedes, turnips and potatoes; and all of them superb crops; I said to myself: why should not we do as well as that? I made a trial of it; I succeeded pretty well; so, I kept on increasing my cropping year by year.

Finally, in 1887, I and one of my brothers bought a farm of 140 arpents for the nice little sum of \$6,000. (1)

I need not tell you that on entering on the cultivation of a farm of that size, we were obliged to buy several horses, as well as the farm-implements necessary for the working of the land for such crops as we intended to grow.

This of course, increased our indebtedness. Upon which we said to ourselves: We must go to work in earnest, we have a heavy load to carry, and we must manage to stand up under it: and this we have done. We went heartily to work, and to day, I am not afraid to say before this meeting, in the very place itself, and in the presence of our creditors, if any of them are here, that we have "paid our way," and reduced the capital debt by more than \$500.

You will perhaps, tell me that that is not much: I confess it willingly. But I wish you to observe that we have only had three crops from the land, and that the whole harvest of this, the third year, is still in our hands, and it is by no means a bad one. I do not suppose it is necessary for me to give you a completely detailed account of our crops, but I persist in saying that, as a whole, the system of cultivating hoed-crops is a paying one.

I am not afraid of declaring that, without our having followed out this plan of cropping, we should never have been able to succeed in meeting our obligation.

Here is an account of our operations:

We had, in 1889, in hoed crops.

Crops	Yield	1,500 bushels =	194 bushels per acre.
potatoes	—	4 500	" = 780
swedes	—	350	" = 410
red carrots	—	400	" = 470
mangels	—	200	" = 460
white turnips	—	15	" = 36
maize	—		"

18 arpents = 15 2 acres.

On the same land in 1889, we sowed:

Crops	Yield	450 bushels =	40 bushels per acre.
barley	—	40	" = 24
wheat	—	120	" = 46
oats	—		"

The whole was sown down, in 1889, with timothy, and this year, 1890, off the same land, we carried 4,000 bundles of hay, equal to 30 tons, or 2 tons per imperial acre. We intend to leave this land in hay for two or three years more; we shall then pasture it, for a year or two, and then begin the same rotation over again. We mean to change the land for our hoed-crops every year, and follow the rotation as above described.

As you well know, people often assign as an opposing reason to my thesis that it is very easy for so and so to do so; he is rich; others say: Oh! he has a lot of children; .. coste him nothing for wages.

To us, neither of these arguments will apply. As to the former, as I said above, we bought this farm without paying a dollar in ready money for it; as to the second, I have no children, and my brother, who is ten years younger than I, is only beginning his family, the oldest of his children being only six; consequently, there being only we two to work, we are obliged to pay for all the labour required.

It is unnecessary to say that, in order to be able to meet our engagements we must grow large crops, and that it follows that we have to employ a good deal of labour, which has to be paid for.

Allow me to say, before I conclude, that it is a very fine thing to be one of Fortune's favourites, as well as to have several children to help one, but although it is an advantage to be in either one of these situations, I can assure you neither is indispensable to success. There is one thing that

is indispensable: earnestness; and to this I may also add perseverance.

From my own experience, I can assure you that, if you adopt this method of farming and give it all the care it demands, your success is certain, for I am convinced that what we have been able to do, can be equally well done by any other farmer.

I bear this testimony here, without any exaggeration.

I trust, Mr. President, that the few explanations of our system that I have just given will be useful to the worthy Dairymen's Association as well as to farmers in general: that is my earnest desire.

SÉRAPHIN GUÈVREMONT, Sorel.

November 1890.

Read at Sorel at the D. Ass. meeting.

(From the French.)

DE OMNIBUS REBUS.

Montreal, September 8th, 1891.

*Wonderful crops.*—A special to the *Montreal Star*, dated August 6th, states that a deputation from the Dominion Millers' Association visited the Experiment-farm at Guelph the day before, to get information from the different samples of winter-wheat grown there. The yield seems to have been wonderfully good—from 40 to 65 bushels an acre—and the weight of the bushel varied from 60 lbs. to 64½ lbs. The samples that the Millers recommended farmers to sow were the "Surprise," the Winter Eyfe, Canadian Velvet-chaff, and the hybrid-Mediterranean.

I take it for granted that these enormous crops were *fields* of grain and not plots of the 20th of an acre; and I make my compliments to Mr. Shaw, as having practically proved that the best land in Ontario, under really good cultivation, is capable of producing as great an amount of winter-wheat as any of the most favoured districts of England.

The yield of oats was calculated at 100 bushels an acre!

I should be very much obliged to Mr. Shaw if he would let me know the return of grain obtained from the land sown in rape and fed off by sheep.

If some of our more backward farmers could see these fields of grain, I wonder if they would believe their eyes!

*Cost of growing silage-maize.*—Mr. Saunders, of the Ottawa Experiment-farm, puts the cost of growing silage-maize at \$32.65 an acre. Now, supposing the crop to give what he calls "a fairly good yield," i. e., 20 tons to the acre, the cost of a ton would be \$1.63. But why does Mr. Saunders charge \$4.60 for 100 lbs. of sulphate of ammonia — = 92.00 a ton—? Mr. Vasey's price, at Hochelaga, is very little over \$3.00 for that quantity = \$62.50 a ton!

*Striped-beetle.*—A half-teaspoonful of turpentine, mixed with a pail of ashes and applied every two or three days, is said to keep the striped-beetle away from cucumber- and melon-plants.

*Potato-sets.*—At the Michigan Experiment-farm, in 1890, as well as in 1889, the largest yield of potatoes was obtained by from 13 to 27 bushels of seed per acre, the largest *net* yield being from 13.7 bushels. It also appeared that halves are better than whole potatoes of the same weight. The truth is, that up to the present date, no experiments have turned

(1) 140 arpents = 112 acres, nearly.

out to be thoroughly satisfying on this point. The safest plan, in my opinion, and I have planted many an acre, is to make the sets moderately large: whether whole or cut is at present a toss up. (1)

**Feeding experiments.**—At the New York Station an experiment was made with 2 years old half bred Holstein-short-horns, "for the purpose of comparing the relative feeding values of a nitrogenous vs. a carbonaceous ration with growing and fattening animals." Two lots were made each containing two steers and two heifers. The hay, silage, and roots were the same for both lots, and all received wheat bran and corn-meal, but in the case of lot 1 part of the corn-meal was replaced by either linseed meal, gluten meal, or cottosseed-meal. The trial lasted 163 days, and the conclusion arrived at was, "that the substitution of nitrogenous foods for corn meal and a small quantity of bran, was not followed by any advantage as a fattening ration, so far as the increase in live weight indicates."

The meat of the animals fed on the more carbonaceous ration was thought to be "much the tenderer and sweeter."

Sir John Lawes came to the same conclusion many years ago: see his "Experiments on pig-feeding," R. A. Society's Journal, Eng.; No. XXXII, 1853.

**Sowing-crops.**—An interesting trial was made, at the Pennsylvania State College, on the yield and nutritive value of sowing crop. The land employed for the purpose was very heavily manured. The total yield per acre, and the yield of digestible food ingredients were as follows:

YIELD PER ACRE.

	Total green food	Total dry matter.	Digestible.			
			Albuminoids	Non-albuminoids	Carbo-hydrates	Fat.
	Pounds	Pounds.	Pounds.	Pounds.	Pounds.	Pounds
Rye .....	15,890	2,491	106	209	1,310	90
Clover .....	26,650	4,094	515	96	1,614	139
Corn-fodder	17,890	1,782	195	46	857	28

To shorten a long story:

THE YIELD OF MILK AND BUTTER PER ACRE WAS:

		Milk.	Butter-fat.
Green	Rye .....	2,120 lbs.	84 lbs.
	Clover .....	3,098 "	125 "
	Corn fodder..	1,508 "	65 "

Thus, taking the milk all round at a cent a pound the clover yielded, per acre, \$30.98; the rye 21 20; and the corn-fodder \$15.08. Or, in butter at 20 cts. a pound: clover \$25.00; rye \$16.80; and corn-fodder \$13.00, besides the skim-milk for the calves and pigs. A fair proof, as far as one experiment can show, that of all green-meats, clover is the best and corn the worst; and yet Mr. Tylee, of Ste-Thérèse, has no opinion of clover-silage, probably, because the corn he ensiles is ripe, or nearly ripe, in the grain. (2)

(1) Except for the ash-leaf kidney, which must never be cut.

A. R. J. F.

(2) See "clover-silage" at the D. Ass.

**Ensilage.**—The samples of ensilage sent to the Dairymen's Association last year for judgment were six in number: five of corn-silage and one of clover.

On these, the report of the judges was as follows:

"MR. FISHER—Gentlemen; M. l'abbé Chartier was to have presented the report on the samples of silage, but he was obliged to leave, and he begged me to take his place.

There are five samples of corn-silage, all of excellent quality. The best, we found in the box made of green-wood, but the name of the owner we could not discover. This maize is of the best quality, it was ensiled at a fit degree of ripeness, and had not suffered from frost. Even now, it has still the appearance of fresh cut corn. With the exception of a slight development of acidity, it has undergone hardly any change since its ensilement. (1).

The next sample came in a cheese box. Neither of this could we find the proprietor's name. This sample also was cut before frost, and is fairly ripe. It contains a good amount of nourishment; only its preservation is not so perfect as that of the former sample. (2)

(1) and (2). Since the meeting, the secretary has found out the names of those who sent in the samples. No. 1 was furnished by Mr. Joseph Dumas, of St-Isidore de Dorchester; the second by the Rev. M. L. Gagné, curé of St-Ferdinand d'Halifax. Both these exhibitors are only beginners in silage-making. This proves the truth of what has often been observed: there is no agricultural novelty so easily put into practice as the making of silage.

The third sample is from Mr. Cartier, of Kingsey. Its quality is about the same as that of No. 2, except that the maize was not cut fine enough; and Mr. Cartier was anxious that we should state that to ensure the good preservation of silage, it is almost absolutely necessary that it should be cut fine.

The fourth is from Mr. Brodeur, of St-Hugues. This is a well preserved sample, but we do not think the maize was ripe enough before it was cut; and it had also been slightly frozen before it was ensiled.

Sample 5, belonging to Mr. Monat was cut into too long pieces by the chaff-utter. It fermented a little too much in the silo.

Mr. J. Damien Leclair sent a sample of clover-silage. It is perfect; we find that it contains much more nutriment than either of the preceding samples. Its only defect is that it was not chaffed before ensilement."

I have always held that clover would make better silage than corn, if properly cut and packed; and the amount of weight per acre, if the clover were mown three times—in early June and August, and late September—would be very nearly, if not quite as great as a crop of silage-corn.

But, there is something much more astonishing to my mind in the fact that Mons. Choquette, of the experiment-station at St. Hyacinthe, finds that Mr. James Drummond's silage, made from sweet-corn, the cobs of which were gathered and sent to market, (1) was by far the most nutritious of 15 samples sent him for analysis!

Valued at the usual rate for carbo-hydrates, albuminoids, and fat, the average samples were worth \$2.26 a ton. The most inferior sample M. Choquette's values at \$1.40 a ton; the second best, at \$3.18, but Mr. Drummond's he reckons to be worth \$3.54, and this without the grain! In this, there was only 74.86 % of water, while some of the other lots contained as much as 87 %! Of albuminoids Mr. Drummond's contained 2.33 %, the average being 1.43. The average of fat, worth as much as the albuminoid, was .62%, but of Mr. Drummond's 1.70 %—nearly three times as much—some of the other samples holding only 0.35 %, and the very

(1) They sold for \$50 an acre!

A. R. J. F.

best only .82 %; while, as regards starch, sugar, &c., the average is 8.36 %, the best 12.83 %, and Mr. Drummond's 11.26 %. but as these carbo-hydrates are only worth about  $\frac{1}{3}$  of a cent a pound, the inferiority in this constituent is of no great importance.

Surely, after this, there can be no doubt, as to the proper corn for silage. If sweet-corn without the grain produces such valuable feeding matter, what would it do with the cobs?

*scats at will.*—So long ago as 1520, Dr. Huarte, a Spaniard, or rather a Navarrese, published a pamphlet, in French, on *L'art de procréer les scats à volonté*, i. e. "The art of begetting male or female offspring at will." This was translated into English about 1630, and published in a curious collection called, "The tryal of Wits;" but I cannot find a copy of it nearer than the British Museum. Would it aid our breeders in scouring bull-or cow-calves at will? May be.

*Turnips.*—"The feeding value of the English turnip," says Dr. Hoskins, "is very much underrated. Cows, not only dry, but in milk, can be made fat on them with but very little hay and grain—in fact, without any grain. We have had a visiting butcher, in February, put his hand on cows so fed and say he had not handled better beef all the winter. If fed directly after milking, the odor will not appear in milk or butter." I am glad to hear such favourable testimony from so practical a man as Dr. Hoskins. By turnips, I conclude, the writer means swedes as well as the different kinds of white rounds, strap-leaf, &c. I should be very glad to hear that Dr. Hoskins had tried a fair experiment between the same weight of swedes and of silage-corn, both as regards milk and meat-production. If he tries it, I am perfectly certain no preconceived ideas will divert him from drawing a fair deduction from the premises.

By the bye, if Vermont turnips and hay will fat a beast, they must be very superior to our South of England roots, which will only keep a bullock or a sheep in fair growing order. There is still a great deal to be discovered on this point. Why will Aberdeenshire turnips and straw fatten a beast when Kentish turnips and the best hay won't? Why will roots grown on the low seaside lands of Sussex ripen sleep, when the upland roots, grown only 15 miles off, will only keep them in decent condition? The answer is: Nobody knows.

Again Dr. Hoskins says again: "Hay- and gra. .-caps are the means of saving much money. These and *root-growing* are good things that American farmers fail to appreciate at their true worth." Just read Séraphin Guévremont's article on Herd Crops, taken from the Report—1890—of the Dairy-men's Association of the Province of Quebec, which will be found at p. 156 of this number of the Journal, and see whether there is not at least one American farmer who "appreciates growing roots at its true worth."

*Stimulants.*—Why will people continue talking of artificial manures as *stimulants*. They do not call the constituents of farmyard dung so; and yet the nitrogen, phosphoric acid and potash of guano are as much plant food in the strictest sense as the same matters in dung. A stimulant acts on the nervous system; how then can either land or plants, which have no nerves, be stimulated? What analogy can exist between brandy and nitrate of soda? The plants themselves will show what kind of food they require by their appearance. Look, in spring, at your young wheat, for instance; does it look pale and sickly? It is starving for want of nitrogen. Give it a fair dose of that in the form most available; its whole appear-

ance will be changed as if by magic, and it will at once exercise its renewed power of availing itself of the mineral matter in the soil, matter always present, but which the plant, before the dose of nitrogen was exhibited, was incapable of assimilating.

*Nitrification.*—Dr. Hoskins does me the honour to read my lucubrations in this publication. Would he have the kindness to explain the grounds of the two opposite statements contained in the following extract from the Country Gentleman? I do not see the Rural New Yorker, so I am utterly in the dark as to the discussion, wherefore I forbear to say more about it.

"*Nitrification.*—In the Rural New Yorker of Aug 1, in reply to the question, "Does Sunlight Injure Land?" I see that T. H. Hoskins of Orleans County, Vt, says, "nitrification is favored by darkness and moisture," and Prof. L. P. Roberts, of the Cornell experiment station, says, "sunlight and heat hasten nitrification, and the result is a positive addition of nitrogen to the soil." When the doctors disagree, who shall decide?" E.

*Pease vs. bran.*—Here, again, is a curious statement, made by a man who is supposed to know, *practically*, all about the feeding of dairy-cows, and contradicted by one who is at the head of the New-York Experiment Station:

*PEA MEAL VERSUS BRAN.*—In your issue of July 23, page 602, in reply to the question, "Shall We Grow Peas for Forage?"—Ex Gov. Hoard is quoted as saying, "By all means; peas are one of the finest butter foods in the world. One pound of pea meal is equal in feeding value to six pounds of wheat bran." I give below the analyses of pea meal and wheat bran according to German and American authorities:

	Pea Meal.		Wheat Bran.	
	German	Amer'n.	German	Amer'n.
Albuminoids.....	22.4	20.77	14.0	15.19
Carbohydrates...	52.3	55.75	50.0	53.72
Crude fibre.....	9.2	4.06	17.8	9.33
Fats .....	2.5	1.43	3.8	3.68

From the above analyses it will be seen that both pea meal and wheat bran, as is pretty generally known, are valuable foods, and from the analyses also it would be rather difficult, without careful trial, to determine which of the two was the more valuable, and I think none would be disposed to agree with the above statement credited to Ex Gov. Hoard.

New-York State Exp't Station. PETER COLLIER.

Judging from the valuation of the constituents of pease-meal and bran given in Stewart's book on feeding cattle viz:

Albuminoids per pound	4 $\frac{1}{2}$ cents.
Fat.....	4 $\frac{1}{2}$ do
Carbohydrates.....	.9 do

The pease-meal should be worth \$1.44 per 300 lbs, and the bran \$1.01 per 100 lbs. But Stewart's analyses are very different from those given by Mr. Collier:

Pease—Digestible nutrients.		
Albuminoids.	Carbohydrates.	Fat.
20.2	54.4	1.7
Bran—Digestible Nutrients.		
Albuminoids.	Carbohydrates.	Fat.
10.0	48.5	3.3

*Value of dung.*—I mentioned lately the fact that, in Montreal, the usual contract price for the manure of each horse in the stable of the City Passenger and other companies was \$2.00 a year. Now, I find in the bulletin of the New-York Experiment Station the following statement of the theoretical value of the manure of 1000 lbs. of each kind of animal usually kept on the farm :

"The product from horses in stable would be \$19.12 ; from horses at work, \$11.47, their droppings outdoors not being included. From cows, \$29.82 ; from sheep, \$38.55 ; and swine, \$17.11. The 1,000 lbs of living swine giving so much less manure in quantity than the other animals is one reason their yearly manure is smaller in value. The value of the manure by the ton is much the greater from sheep. There are many other interesting facts given in this bulletin, in connection with the value, amount produced, loss by exposure, composition and other particulars in connection with farm manures, which the want of space forbids noticing."

From this I deduce that the manure of an ordinary cow produced in a year is worth as much as one ton of plain superphosphate, plus nearly five cwts. of sulphate of ammonia. I confess I would rather have the two latter articles.

*Rye and wheat.*—A. J. C., a correspondent of the *Country Gentleman*, does not hesitate to make the following heretical statement, and, which is still more extraordinary, the editor of that widely circulating paper, allows the statement to pass unnoticed :

"Many farmers who raise wheat do not like to have rye on the farm. For in such a case, wheat is likely 'to turn to rye, just as it does to chess in like circumstances.' Does wheat ever turn to chess? What is chess? I have grown rye side by side with wheat over and over again, and have seen the two crops hundreds of times ripen their grain on the same farm, but I never even heard before of the one being metamorphosed into the other.

*Effects of frost on corn-fodder.*—At the Sorel meeting of the Dairymen's Association of the Province of Quebec, Mr Fisher, speaking of the effects of frost on silage-corn, stated that, "on one occasion, his corn had been severely frozen, but, in spite of that, his ensilage was almost as good as usual. He did not think that a little freezing was very injurious to corn, though he preferred that it should escape frost altogether."

At one of the American Experiment Stations, analyses of samples of corn from cuttings made October 24th, somewhat frosted, and November 13th, after several severe frosts, showed a loss of 31 % of the albuminoids, 9.7 % of the crude fibre, 22.7 % of the carbohydrates, 47.6 % of the fat, and 33.4 % of ash in the crop harvested November 13th.

The bulletin from the same station remarks that on September 13th, the total dry matter per acre in King Philip corn was nearly as great as in the B. and W. though the former was 9 feet high and the latter 13 ; while it is probable that each pound of dry matter in the King Philip was worth enough more than an equal weight of the B. and W. to make up for most of the difference in weight. "This," the bulletin adds, "would seem to indicate that corn that will ripen should be cut as soon as it glazes, while the larger silage-corn should in this latitude (N. Y.), be allowed to stand as long as possible.

It is, I think, clear that by the time the corn has begun to glaze, all the nutriment that ever will be contained in the whole plant—stem, leaf, cob, and grain—has been taken up from the air and the soil, and that there is no need of waiting any longer before harvesting the crop.

ARTHUR R. JENNER FUST.

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