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EIGHTH REPORT

—OF THE—

DAIRYMEN'S ASSOCIATION

—OF THE—

PROVINCE OF QUEBEC.

SUPPLEMENT TO THE REPORT OF THE HON. COMMISSIONER OF AGRICULTURE AND COLONISATION.

1889.

PRINTED BY ORDER OF THE LEGISLATURE.

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PRINTER TO HER MOST EXCELLENT MAJESTY THE QUEEN.

1890.

EIGHTH ANNUAL REPORT

— OF THE —

DAIRYMEN'S ASSOCIATION

— OF THE —

PROVINCE OF QUEBEC

To the Hon. Commissioner of Agriculture and Colonisation,

Quebec.

SIR,

The Board of Directors of the Dairymen's Association of the Province of Quebec has the honour to offer you the following report of its operations during the year 1889, and of the annual meeting held at Arthabaska, the 11th and 12th of December last.

The Secretary-Treasurer of the Dairymen's

Association of the Province of Quebec,

J. DE L. TACHÉ.

Quebec, Feb. 1st, 1890.

Officers and Directors of the Dairymen's Association

FOR 1890.

Honorary President: The Honorable P. B. de LaBruère, St. Hyacinthe
President: M. N. Bernatchez, M. P. P., Montmagny.
Vice-President: L'Abbé J. B. Chartier, Ptre., St. Hyacinthe.
Secretary-Treasurer: J. de L. Taché, Québec.

DIRECTORS:

District.	Name.	Residence.
Arthabaska	F. Préfontaine	South-Durham.
Beauce	Antoine C. Taschereau	Ste. Marie.
Beauharnois	D. M. Macpherson	Lancaster Ont.
Bedford	S. A. Fisher	Knowlton.
Charlevoix	Chs. Martel	La Baie St. Paul
Chicoutimi and Saguenay	S. Fortin	St. Prime.
Iberville	O. Bergeron	St. Athanase.
Joliette	J. J. A. Marsan	L'Assomption.
Kamouraska	J. C. Chapais	St. Denis-en-bas.
Montmagny	Jacques Collin	Montmagny.
Montreal	Alexis Chicoine	St. Marc.
Quebec	The Abbé T. Montminy.	St. Georges-de Beauce.
Richelieu	Dr. Ad. Bruneau	Sorel.
Rimouski	Chs. Préfontaine	Rimouski.
St. François	N. Bourque	Sherbrooke.
St. Hyacinthe	L. T. Brodeur	St. Hugues.
Terrebonne	Frs. Dion	Ste. Thérèse.
Three-Rivers	The Abbé D. Guérin.	St. Justin.

CONSTITUTION OF THE DAIRYMEN'S ASSOCIATION.

Incorporated by the statute 45 *Vic., Chap.* 66, *P. Q.*

1. The Association takes as its designation: "The Dairymen's Association of the Province of Quebec."

2. The object of the association is to encourage the improvement of the manufacture of butter and cheese and all things connected with the above manufacture.

3. To become a member of the association, a subscription of at least one dollar ($1.00) a year is all that is requisite.

4. The affairs of the association shall be under the direction of a president, a vice-president, a secretary-treasurer, and certain directors named in accordance with the act of incorporation, all of whom shall form the Board of Directors of the association, and shall make a report of the operations of the association at the annual general meeting of the association.

5. The election of the officers and directors shall take place at the annual general meeting, the date of which shall be fixed by the board: to insure the right of voting at the above election, the previous payment of subscriptions will be requisite.

6. When more than one candidate is proposed for the same office, the voting shall be by *sitting* and *standing* (*assis et levés*), the secretary shall count the votes, and the president shall declare the candidate who shall have the majority of votes.

7. The officers elected shall remain in office until the following election, and shall be re-eligible.

8. The president shall take the chair at the general meetings, and at the meetings of the board of directors.

9. The president shall be, *ex-officio*, a member of all the committees of the board of directors.

10. To the secretary-treasurer shall be entrusted all the moneys and other valuables belonging to the association; he shall keep, in a special register, minutes of all meetings of the association as well as of the board of directors, and these minutes shall be signed by the president, or, in his absence, by the vice-president, and by the secretary-treasurer; he shall, besides, keep books in which shall be entered, regularly and without delay, all the monetary operations of the association. At the end of the fiscal year of the association, the secretary-treasurer shall present before the board a statement of accounts for the directors' approbation.

11. The vacancies which occur among the officers or directors shall be temporarily filled up by the board, and the board shall also nominate the directors for those judicial districts which are not as yet represented.

12. The board, to insure greater efficacy, shall be at liberty to claim the services of specialists as advisers.

Rules and Regulations of the Dairymen's Association.

1. The annual or general meetings of the association, as well as those of the board of directors, shall be called by notice in writing from the secretary-treasurer to each of the members of the association and of the board. Notice of the meetings of the association shall be given at least a mouth beforehand.

2. At the request of three directors or officers of the association, the president may call a general meeting of the board of direction; the call shall be in the form mentioned above.

3. At the meetings of the board of directors, three shall form a quorum, exclusive of the president and vice-president.

4. The board of directors may name, from among its members, a committee to audit the accounts, and other committees for any purpose it may think necessary.

5. The order of business at general and official meetings shall be deter mined by the board of directors.

6. No question shall be submitted for discussion except it be in writing and placed before the secretary-treasurer.

7. The secretary-treasurer shall be obliged to furnish security to the amount of $400.00, which security shall be subject to the approval of the board.

MEETING OF THE 11th AND 12th DECEMBER, 1889.

EIGHTH ANNUAL MEETING; HELD AT ARTHABASKA.

MINUTES OF THE MEETING.

Arthabaskaville, December 11 th, 1889.

The members of the association met in the Hall of the Court-house.

The president of the association, the Hon. P. B. de la Bruyère, took the chair at 10 a. m.

The secretary read a summary of the operations of the association during the year.

Dr. Bruneau and Mr. F. Préfontaine, the auditors appointed by the board of directors, presented the report of their examination of the accounts of the secretary-treasurer, and a summary of the financial operations of the association.

A committee, composed of Messrs. L. T. Brodeur, Ant. C. Taschereau, and Norbert Bourque, was appointed to examine the samples of ensilage, and to report thereon.

A commitee, composed of Messrs. A. Chicoine, H. L. Leclaire, and Frs. Dion, was appointed to examine the utensils exhibited before the association, and to report thereon.

M. J. C. Chapais gave notice to the meeting of an exhibition of stallions that the National Stud-company had brought to Arthabaskaville on the present occasion. At the request of the president, M. Louis Beaubien, president of the above company, gave certain information on the working of this establishment and on the breeding of horses; and announced the exhibition for 1 P. M. precisely.

The secretary received subscriptions, and the meeting adjourned.

December 11 th, P. M.

The president took the chair at 2.30 p. m.

At the request of the ensilage commitee, the Rev. Abbés Chartier and Choquette were added to it to examine the samples submitted.

The report of Inspector MacDonald was then read ; Messrs. Deneau, Allard, Taché, and the Rev. Abbés Gérin and Montminy, made certain remarks on the different points touched upon in the report.

The committee on ensilage presented the report of its examination of the samples submitted ; the committee explained that Messrs. Chartier and Choquette took no part in the classification of the samples, the Seminary of St. Hyacinthe, with which they are connected, being one of the competitors.

The Abbé Chartier next gave a lecture on the progress of the ensilage-system ; then followed M. Louis Beaubien's remarks, and several observations on the same subject from Messrs. Brodeur and Marsan.

At the request of the president, Mr. J. C. Chapais presented the report of the delegates of the association, at Ottawa, last April ; after the reading of the report, M. Chapais was entrusted with the duty of preparing the following resolution, which was submitted to, and adopted unanimously by the meeting, and, after having been converted into the form of a petition to his Excellency the Governor General in Council, was left on the table for the signature of the members of the association, before its transmittal to the secretary of his Excellency without delay :

The members of the Dairymen's Association of the Province of Quebec, met in convention at Arthabaska, after hearing the report of the delegates appointed to attend a federal convention of dairymen last year, considering :

That the report of the said delegates shows that the effect of the federal convention in question was the creation of a Federal Dairymen's Association ;

That the Association thus created had an interview with the Committee on Agriculture of the House of Commons and obtained from it the adoption of the two following resolutions :

« 1. Proposed by Mr. T. S. Sproule, seconded by Mr. Esson and carried « unanimously : That seeing the extent and importance of the dairy industry « of Canada and the necessity of promoting its interests, this committee feels « it to be its duty to recommend the appointment of a dairy-commissioner « charged with the duty of watching over and promoting as much as possible « the different elements of this important branch of the national industry ;

« 2. Proposed by Mr. Fisher, seconded by Mr. McNeil, and carried unan- « imously : That this committee has heard with satisfaction of the creation « of The Dominion Dairymen's Association, and is of opinion that, seeing « the general advantages that must flow from the labours of this association « and the vast programme it has to carry out, every possible encouragement « should be lavished upon it ; »

That the adoption of one of these resolutions has had the effect of ob-

taining a grant of three thousand dollars ($3,000) in favour of the dairy industry ;

That the appointment of a dairy-commissioner, recommended by the other resolution, seems to us to be urgent ;

That the two above-cited resolutions are connected with one of the most important of the industries that contribute to the national prosperity ;

Considering the above facts, the members of this Association resolve unanimously : That they would respectfully draw the attention of the federal government to the two above-cited resolutions, humbly praying it to act immediately in their favour by first of all appointing a dairy-commissioner, next, in either renewing for the future or in increasing the grant of three thousand dollars ($3,000) already made, but placing it as the disposal of the Dominion Dairymen's Association, in order to aid it in obtaining the end for which it was established.

The meeting then adjourned.

December 11th, Evening.

The session was opened, at 8.30 P. M., by the official address of the Hon. President of the Association.

The Hon. Col. Rhodes, Commissioner of Agriculture and Colonisation, who was present, at the request of the President addressed the meeting; the Hon. J. J. Ross, his predecessor in office, followed.

The abbé Choquette, chemical director of the provincial agricultural laboratory of the college of St. Hyacinthe, explained to the meeting the arrangements he had adopted as regards the operations of the laboratory and showed how the association could profit by the work to be carried on there.

Mr. J. A. Chicoyne, of Sherbrooke, next gave an account of the organisation of the federal experimental stations, particularly describing the central farm at Ottawa.

NOTE :—The following signatures were appended, during the course of the meeting, to this resolution.

P. B. DE LABRUÈRE, Hon. Pres. N. BERNATCHEZ, President,

J. DE L. TACHÉ, Sec. Treas.

J. A. COUTURE,	NORBERT BOURQUE,	ANT. DESJARDINS,
FTS. DION,	JOSEPH ÉLOI JALBERT,	C. MARSAN,
J. M. ARCHAMBAULT,	CHARLES TREMBLAY,	M. ROBERT,
GEO. D. LACHAINE,	ANT. C. TASCHEREAU,	F. X. O. TRUDEL,

J. D. Blanchette,	L. T. Brodeur,	P. J. S. Peltier,
Alexis Chicoine,	Jos. N. Allard,	Saul Coté,
Adolphe Bruneau,	Th. Montminy, Ptre,	Alex. Gouin,
Hertel Brousseau,	J.B. Chartier. Pr.V.-P.	Aimé Lord,
Stanislas Normand,	Paul Denis,	J. B. Vigneau,
F. Préfontaine,	J. C. Bourbonnais.	Prudent Lainesse,
J. L. Painchaud,	J. Louis Lemire,	Delvica Adam,
A Marsan,	C. A. Beaudry,	Pierre Lortie,
O. Boulanger,	J. S. Fortin,	P. Hebert,
A. Quintal,	J. D. Leclaire,	C. B. Lavigne,
Sydney Fisher,	J. Hector L. Leclaire,	J. C. Chapais,
C. P. Choquette, Pr,	Emile Dion,	Joseph Beaubien,
Chs. S. Richard, Pr,	J. J. A. Marsan,	Louis Beaubien,
B. Lippens,	T. C. Chartier.	G. Boulay.
Luc Girard,	Joseph D. Morin,	

Dr. Couture, secretary of the herd-book of Canadian cattle and of the stud-book of Canadian horses, spoke of the progress made in the herd-book, and treated the question of the selection and improvement of dairy-cattle: he also gave the results of the competition of milch-cows for this year.

And the meeting adjourned to the next day.

Thursday, December 12th, 1889, A. M.

The session opened at 9.40 A. M,

The proceedings began with a lecture, by M. J. B. Vigneau, on cheese making.

Then followed a discussion on the subject of the lecture, in which a great many members took part; among others, Mr. D. M. McPherson, of Lancaster, Ont., president of the Federal Dairymen's Association.

M. Damien Leclaire then spoke on butter-making, and was followed by M. Aimé Lord, who put certain questions to the lecturer; then, a general discussion arose, shared in by Messrs. Barnard, Bernatchez, Leclaire, Lord, Chapais, the Rev. Frère Joseph, J. L. Allard, J. A. Marsan, and Taché.

A vote of thanks to the above-named lecturers was proposed by Mr. N. Bourque and carried unanimously.

Notice was given that another parade of the National Stud-company's stallions would take place between noon and one o'clock.

And the session adjourned.

12th December, P. M.

The President took the chair at 2 p. m.

The meeting proceeded to the election of officers and directors of the Association for 1890, with the following results :

OFFICERS

President : Mr. N. BERNATCHEZ, M. P. P. Montmagny.
Vice-President : L'ABBÉ CHARTIER, Priest, St. Hyacinthe.
Secretary-Treasurer : J. DE L. TACHÉ, Quebec.

DIRECTORS :

DISTRICT.	NAME.	RESIDENCE
Arthabaska	F. PRÉFONTAINE	South Durham.
Beauce	ANTOINE C. TASCHEREAU	Ste-Marie.
Beauharnois	D. M. MACPHERSON	Lancaster, O.
Bedford	S. A. FISHER.	Knowlton.
Charlevoix	CHS. MARTEL	La Baie St-Paul.
Chicoutimi and Saguenay	S. FORTIN	St-Prime.
Iberville	O. BERGERON	St-Athanase.
Joliette	J. J. A. MARSAN	L'Assomption.
Kamouraska	J. C. CHAPAIS	St-Denis-en-bas.
Montmagny	JACQUES COLLIN	Montmagny.
Montreal	ALEXIS CHICOINE	St-Marc.
Quebec	L'ABBÉ T. MONTMINY	St-Georges-de-Beauce.
Richelieu	DR. AD. BRUNEAU.	Sorel.
Rimouski	CHS. PRÉFONTAINE	Rimouski.
St-Francis.	N. BOURQUE	Sherbrooke.
St-Hyacinthe	L. T. BRODEUR	St-Hugues.
Terrebonne	FRS. DION	Ste-Thérèse.
Three-Rivers	L'ABBÉ D. GÉRIN	St-Justin.

At the instance of Dr. A. Bruneau, seconded by Mr. A. Chicoine after an eulogium on the out-going President, the Hon. P. B. de LaBruère, the hon. gentleman was unaminously appointed Honorary-President of the Association.

A committee, composed of Messrs. Bruneau, Hébert, Chicoine, Leclaire and Painchaud, was appointed to report on certain samples of butter exhibited before the meeting.

Mr. E. A. Barnard then read an essay on the « Rational feeding of cattle

« for the production of milk,» and showed by statistics how much could be yielded by our cattle under a proper system of feeding.

The Hon. W. Laurier, who was present, at the request of the president addressed the meeting.

Mr. E. A. Barnard, apropos of an observation of M. Laurier, spoke impressively on the importance of the frequent holding of these meetings for agricultural discussion in our country parts ; saying, that the Hon. Commissioner of Agriculture was willing to grant to the association for each of the lectures at this meeting the same sum that is given for agricultural lectures ($5.00 each) ; this was confirmed by Col. Rhodes, who said that he was happy to give this testimony of his appreciation of the labours of the association.

A telegram was then read from Mr. W. H. Lynch, one of the founders of the association, now at Spokane Falls, wishing every success to the meeting. After a few words from Mr. Barnard in praise of Mr. Lynch, the secretary was authorized to thank Mr. Lynch for his sympathy, and for the services he had rendered to the association.

Mr. H. S. Foster, Knowlton, requested the help of the association in obtaining assistance towards the establishment of an English Dairymen's Association for the Eastern-Townships. Mr. McCallum made the same request, and the president stated that these applications should be taken into consideration at the next meeting of the committee of directors.

Mr. Norbert Bourque, East-Sherbrooke, lectured on "The effect of the shade afforded by plants on the soil where they grow;" Mr. Barnard and M. Lippens made some observations on the subject of the lecture.

M. l'abbé Montminy read an essay, by Mr. C. E. Dalaire, school-master at Ste-Rose, on the *Working of Agricultural Clubs.*

And the session adjourned.

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12 th December: Evening session.

The president took the chair at 8 p. m.

M. l'Abbé Montminy submitted for ratification by the meeting the choice which the new board of directors had made of Sorel as the place where the next meeting shall be held. The choice was unanimously accepted ; and it was decided that the meeting shall be held, in that city, at the end of November or the beginning of December next.

The professor-inspectors of the association presented their reports in the following order : Mr. J. M. Archambault, report of the school-factory of

St. Hyacinthe ; MM. Jos. L. Painchaud and Saül Côté, reports of inspection.

The committee of inspection of utensils reported, as did the committee of examination of butter-samples.

Next, arose a general discussion on cheese-making, in which took part Messrs. D. McPherson, J. A. McDonald, J. M. Archambault, J. B. Vigneau, J. N. Allard, Fras. Gendron, Arthur Marsan, J. de L. Taché, etc.

Notice was given that the competition open to Canadian cows would be continued next year.

The president, in the name of the association, thanked the inhabitants of Arthabaska, the authorities of the Court-house, and the lecturers, all of whom had contributed greatly to the success of this meeting.

A special vote of thanks to the inhabitants of Arthabaskaville, for their hospitality, was adopted at the instance of M. Chapais, seconded by the Rev. N. Montminy.

And the convention was dissolved.

EXTENDED REPORT.

Opening Address of the PRESIDENT of the Association.

Gentlemen,

If those hardy pioneers who, half a century ago, were the first to penetrate into what used to be called « les bois francs » were to find themselves here to-day, what would be their astonishment at seeing, on the territory of their labours, a meeting so numerous, so distinguished, of farmers and of friends of the dairy-industry !

They were our precursors in the road of progress ; and some of those who now hear my words have no doubt been acquainted with those clearers of the bush, who, axe on the shoulder and courage in the heart, left St-Pierre les Becquets and Gentilly, to plunge, before any others had attempted it, into the forests of Somerset, Stanfold, and Arthabaska.— There were no roads there in those days.—These steel-armed colonists left the older parishes with 80 or 100 pounds of flour on their backs, labouring painfully along on foot through the bush, over bogs, with bent necks and with bodies covered with sweat, enduring hunger, but induced, as it were irresistibly, to take upon themselves these toils, and led by the hand of Providence, which desired to place upon this virgin soil a chosen race. *une race d'élite.*

Is it not from the hearts of those incomparable clearers of the bush that

we must draw our supplies of family affection and of love for our natal soil ?

In this spot where I am speaking, I owe this homage to the memory of the colonisers of the « bois francs, » whose patriotic mission produced the results that we see before us in this prosperous town of Arthabaskaville and in the lovely townships around it.

And it was indeed with pleasure that the members of the Dairymen's Association received the kind invitation to hold here their annual meeting for 1889-90.

I have, however, one regret to express : I could have wished to see among us that distinguished man owing to whose initiative this meeting was arranged to be held at Arthabaskaville. I speak of the Hon. Ed. Pacaud, Legislative Councillor. whom death has lately ravished from his admiring fellow-countrymen.

The kindly reception of which we are the object is a great encouragement in the work which we have undertaken, namely, to push forward one of the most important industries of the country, and to impart to it that impetus that has already caused it to produce such splendid results for the agriculturists of this province.

I say « one of the most important industries », since, in truth, independently of the local consumption, it represents at present an annual exportation of goods to the amount of ten million dollars.

In order to ascertain what were the operations of last season, we must be guided by the statistics of the port of Montreal, the most important in Canada.

At this port, were received, during the summer, 1,173,049 boxes of cheese, and of these 1,155,578 boxes were exported ; an increase of 20,000 boxes over 1888.

This exportation, from Montreal alone, is equal to 69,335,000 pounds. The reports to the Dominion Government show that, during the year ending June 30th, 1888, there were exported from Canada 84,173, 267 pounds of cheese, worth $8,928,242. In 1882, the year of the foundation of our association, the exportation was 50,807,049 pounds ; thus, in six years, our exportation of cheese has increased by more than 33 million pounds.

At the inauguration of the Confederation, 1868, Canada exported only 6,111,482 pounds of cheese

Last summer, 1888, the exportation must have exceeded 90 million pounds

The butter we make is far from enjoying the same reputation in Europe that our cheese has. Every body knows that. And our exportation of it

is not on the increase, because we cannot compete with certain European countries in the excellence of this product.

Still, I may say that the number of tubs of butter received at Montreal increased by 52,000 in 1889. Last year, 1888, it was 85,292 this year 137,292, and of these there were only exported 62,076 tubs; which shows that the local consumption of Montreal is already of importance.

I would draw the special attention of butter-makers to this fact, for, as has been already said in our previous meetings, it is wiser to sell butter as soon as it is made and while it retains all its flavour, than to expose it to deterioration by leaving it too long in storage.

In 1889, eighty-four persons attended the school-factory at St. Hyacinthe for the purpose of perfecting themselves in the art of cheese-making. During the season, 314 establishments were visited by the association's inspectors, 50 of which were creameries and 264 cheese factories.

Of this number, thirty factories are connected with the private association formed by English-speaking farmers of the Eastern-Townships. Such an inspection proves that our association partakes of a provincial character, and that all the friends of the farmer-class, be their nationality English or French, ought to belong to it, in order that its sphere of action may be enlarged more and more, and that its beneficent action be extended from the boundaries of Ontario to the shores of Gaspé.

I am, then, I believe, acting in accordance with the views of the board of directors of our association in appealing to every class and to all the races of the province of Quebec, and beseeching them to join their efforts to ours in spreading abroad agricultural information by means of our meetings and interesting reports, and thus developing the prosperity of the country.

We, both English and French in Canada, have a common interest in striving without cessation to perfect the manufacture of dairy products, in order to enable us to enter upon an advantageous competition in the European markets. As the improvement of the manufacture may be more easily attained by means of syndicates, thence derives the necessity of factories protecting one another instead of quarrelling; for it is the average quality of cheese and butter which fixes the price paid by buyers or exporters. These, unless they find on their journeys some very bad cheese, pay the same price to every one; thus the good makers suffer for the faults of the bad ones.

A good understanding between the patrons of the factories in the same districts, an intelligent and persistent inspection of the creameries and factories, the employment of skilled makers, at high wages if necessary, their superintendance by those interested in the profits: these are the means of improving the manufacture and of raising the prices. To be looked upon

with distrust is every maker who says « he knows all about it, » and refuses to allow his factory to be inspected.

The local meetings of cheese-makers at which the inspectors of our association attended, have yielded good, but not yet perfect results. Both patrons and makers must come to an understanding, and fix, at the beginning of the summer-season, the day and the spot on and at which the inspectors are to give their lessons. Those interested should be present in great numbers in order to profit by the information they seek for.

To the oral teaching of the inspectors, the board of directors has added a lavish distribution of its reports in English and French, which form in themselves so many treatises on agriculture, perfectly adapted to the wants of our country parts; since therein are contained the writings of our most distinguished agriculturist, such as the Messrs. Beaubien, McPherson, Couture, Barnard, Lynch, Casavant, Chapais, Jenner Fust, Marsan, and others.

I recall to your memory the great meeting held at Ottawa, last April, for the purpose of laying the foundations of an association for the protection of the dairy-industry thoughout the Dominion.

There, were to be found representative from almost all the provinces; men thoroughly skilled in agriculture, as well as several senators and members of the House of Commons.

This convention thought it right to draw the attention of the federal government to the end for which it was convoked, and the parliament voted a sum of $3,000 to enable the founders to proceed with the organisation of the association.

It is believed that the Ottawa Cabinet will appoint a commissioner to watch over the development and the progress of the great dairy-industry. It is the general opinion that this central association will be a powerful assistant to such provincial ones as ours, and will have a great share in the promotion of agricultural industry.

Let us labour, gentlemen, for the development and the welfare of our country. Agriculture is the foundation of the wealth of nations; let us strengthen it by the united aid of our efforts, our good will, and our intelligence.

« Let us go in and possess the earth » (emparons nous du sol), is a device which we should always bear in mind, for it contains good, sound, practical sense; but it will not satisfy our aspirations and our hopes for the future, if, in taking for our own the soil, we do not strive to improve it for the purpose of drawing from its bosom the riches it contains. Let us clear the bush, but let us know how to preserve its natural fertility by cultivating it in a skilful manner; let theory be united to practice, and guide the arms of our intelligent rural population. The province of Quebec, occupying by its

geographical position, the extent of its territory, and the number of its inhabitants, so important a position in the Confederation, all its farmers ought to feel it their duty to unite their efforts to develop the resources of the soil.

Agriculture is, par excellence, the national question, and the duty of governments is, casting aside all party-feeling, to assist in perfecting that art, and to encourage freely the associations which, having no pecuniary interest to serve, consecrate their energies in causing the spirit of progress to penetrate the masses of the people.

During the seven years our dairymen's association has been at work, it has, in spite of limited means, done a great deal in this way. Having had the honour of discharging—very imperfectly—the duties of president from the first, I have noticed the work of its members; I have admired the devotion and patriotism of those who by their exertions have shared in the work of spreading abroad a taste for good farming; wherever we have held our annual convention, at St. Hyacinthe, at Quebec, at Three-Rivers, at l'Assomption, there, numbers of farmers have come to imbibe new ideas and useful lessons.

It is a pleasure to me to be able to state that the Arthabaskaville meeting has been as fruitful of good as the others, and I beg to offer the thanks of our association to those who have honored our meetings by their presence.

When we see here, at our meeting, the Hon. Commissionner of Agriculture, personages occupying lofty political positions, and the representatives of all the different classes of society, we cannot but think that we possess the sympathy of all, and that our cause is the cause of the people.

OFFICIAL ADDRESSES.

Speech of the Hon. W. E. Rhodes, Commissioner of Agriculture and Colonisation.

Mr. President and Gentlemen,

At the same time that I feel great pleasure in finding myself among you this evening, I am also greatly encouraged, for I see here many persons who could assist me in discharging the difficult duty incumbent upon the Minister of Agriculture of the province of Quebec.

A minister of agriculture is supposed to know everything and to understand everything: that is the theory, but it is by no means the truth. I am,

therefore, very glad to be able to come to you for information, full as you are of knowledge and experience.

We are labouring to the same end; and what is that end? The improvement of the country, the establishment therein of young colonists who aim at living on their native soil, and even to live well thereon.

I have long known this district. Thirty-four years ago I was president of the Richmond and Quebec railroad. In my youth, I worked with your fellow-citizen, Antoine Gagnon, at the development of the roads in the province of Quebec. You see how we succeeded. That is not all. Since that time, many railroads have been made in America, and the province of Quebec has not been neglected. It is to this work that I have devoted the last forty years of my life, and although my hair has turned white I hope still to be able, with your aid, to devote a few more years to the development of the province and to the establishment in life of our children.

I am a good Englishman, a good citizen; I mean to do the best I can for my country, and I can promise you one thing: I intend to respect the traditions of the department as regards the Dairymen's Association. The Hon. Dr. Ross, while he was in power, assisted, as far as possible, the dairy-industry. I shall do all I can to follow in his footsteps, for I see no better example to follow. Dr. Ross is a friend of mine, I have a high opinion of him; we were engaged together in the building of the North-Shore railroad; and, in this particular point of the dairy-industry, I think I cannot do better that follow the tradition that he instituted.

We are at present occupied in preparing the estimates. I may tell you, without pledging myself to strict accuracy, that there will probably be a slight increase over the sum voted last year for colonisation. There were last year, in round numbers, about $250,000 appropriated to agriculture, besides $50,000 for seed-grain; in all, $300,000. This year the subsidy will be about $314,000.

Doubtless, we shall be found fault with by those whose duty it is to do so. We shall be blamed for having increased the expenditure. Well! if we have spent more money, we have a larger family to provide for. I do not see how we can diminish the subsidy without the people suffering.

We desire to make the province of Quebec the leading province of the Dominion, and I hope we shall succeed in our aim. I was very much surprised during my tour of visits this year at the great difference I observed to exist between different counties. The only characteristic common to all is the use of the two languages, French and English. With these two languages, one can be understood everywhere; but, apart from this, in going

from one county to another, and still more, from one region to another, great differences exist between the men, as well as between the crops.

In England, hardly any two counties are alike ; the Lincolnshire men are not the least like the Devonshire men, neither do the Lancashire people resemble the men of Kent. (1) It is almost the same in Canada.

I observed that, in every county, there were about forty well educated men, almost equally divided as to politics, who are necessary to the proper conduct of the affairs of the county, and are perfectly up to their work.

Another noteworthy thing in the province is that all the clergy are thoroughly at one as regards such ticklish questions as those connected with religion. Great friendship exists, generally, between the curés of the different parishes.

Again, your population increases in a remarkable manner ; in this point, no race in the Dominion can be compared to the colonists of the province of Quebec.

I can assure you, speaking as minister of agriculture, that the Government is well disposed towards you. Next year we are going to begin by passing the act of Agricultural Merit, and other things will follow. I only came here because I was told that my presence was extremely important, and I did not come to show myself, but to gain information. For the same purpose I visited the country places, and inspected the factories and the schools of art and trades.

My desire is so to act that my successor may take me for a model, and that it may be said : the best thing you can do is to follow in the footsteps of Dr. Ross and Col. Rhodes. But to aid me in this my object, I need your help. Every man present has his specialty, and may be a useful adviser to me on certain points. Come and see my garden, and I promise to teach you many things.

Hold your meetings frequently ; do your best to develop this industry, which is a source of riches to the country. It is your duty ; it is the duty of us all ; and when we have done our duty in this world, we may take our chance in the next.

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(1) The Lincolnshire men descend generally, particularly in the Northern division, from the *Danes*; the Devonians from the *Saxons*. The Lancashire people, from their geographical position, have a large admixture of *Keltic* blood, derived from Welsh and Irish immigration, and the *Jutes* settled Kent. *(Trans.)*

THE HON. P. B. DE LA BRUÈRE.

Sir,

Allow me to thank you for the sympathetic words you have uttered in favour of our association. I see that you are well disposed towards us, and that we may look for assistance from the Government. As you observed, there should be no politics introduced into our association : it has never been a political society.

The chief power of our society lies in the devotion of its members. I hope, therefore, that the grant that we have received will be increased, that we may be able do all the good we desire to do.

At first, the sum of one thousand dollars might have been sufficient for our association, but permit me to tell you that to-day it is not enough.

Last year we had the honor to ask for an increased subsidy ; we observed that five thousand dollars were allotted to factories and creameries, and we hope that, this year, our request will be granted. And be assured Sir, that the funds of the Government can not be entrusted to safer hands than those of the board of directors of the dairymen's association.

ADDRESS OF THE HON. J. J. ROSS

Mr. President and Gentlemen.

Your dairymen's association is a regular surprise-box ! Last year, I went to the meeting at l'Assomption to listen to the lectures that were to be given there, with a view to gaining information from them, when, all at once, in the very middle of a session, I was asked to speak ! I beg you to believe, Mr. President, that I appreciated the honour conferred upon me, but, on the other hand, I could not help feeling some regret, for the sake of my hearers, that I should be forced, in some degree, to address the meeting, utterly unprepared as I was to do so.

This evening, here I am again, with the same object in view that I had last year when I went to l'Assomption, and here once more I am taken by storm and again begged to speak. As at l'Assomption, I beg you to believe that I appreciate the honour conferred upon me, but, here as there, I regret sincerely for your sakes that I am not prepared to deliver an address or a lecture on a subject that will either interest or instruct you. I repeat that I am in no way prepared to address you this evening. Anyhow, since you have caught me and invited me to speak, you must suffer some punishment for your severity, so I will endeavour to say a few words to you.

I shall limit myself to speaking of agriculture in general and making

a few remarks which will not, perhaps, be inopportune, though they will certainly not have the merit of being thoroughly thought out.

Permit me, in the first place, to thank the Hon. Minister of Agriculture for the kind words which he addressed to me. I, like you, am convinced that the Hon. Minister is full of good intentions, and that he will do all in his power to improve this important business, this so useful an industry, one that lies at the foundation of the others, that of agriculture.

Gentlemen, this is a convention of the dairymen's association, but to this industry, you will allow with me, all the other industries connected with agriculture are allied. If you devote yourselves specially to the promotion of the dairy-industry, without attending a little to the other branches of agriculture, I greatly dread you will never gain your end; and besides, if you do so, you will put all your eggs into the same basket, when, if you miss your stroke, all will be lost.

Thus, then, in order to promote, to cause the dairy-industry to prosper particular attention must be paid to the other branches of agriculture. For, if you desire to produce a greater quantity of milk, you will want a greater quantity of hay, more grain; and, lastly, the means of buying cattle and of feeding them properly. And the means to arrive at that point is to take advantage of all the methods, of all the branches of which agriculture is composed.

I was particularly pleased at hearing the report made by the president of the association. I observed with pleasure the progress we have made during the last few years.

A few years ago, the dairy-industry was a matter of little importance in the country; cheese-making was but a trifling affair compared to what it is to-day, and, if nearly as much butter was made then as now, it was because the quantity of cheese made was less than it is to-day. One thing surprises me, and I make the remark in passing, that fault is found because the manufacture or the exportation of butter does not increase in proportion to the exportation of cheese. The explanation of this seems to me to be very simple.

If, with the same quantity of milk, you increase the make of cheese, you cannot increase the make of butter. I do not see in this calculation any reason that the making of butter should be altogether neglected, or that this industry should be forgotten, but I do see reason to believe that it is found that cheese-making pays better than making butter.

I must acknowledge, gentlemen, that I am not greatly skilled in this matter, but it seems to me that the problem awaiting solution must present itself pretty frequently, that is to say: is it more profitable to make cheese than butter? It is a very important question. I know that a good many peo

ple think it more profitable to make cheese. Others, the minority in my opinion, believe that butter pays the better. And although it is, in a country enjoying responsible government, the majority that should decide the question, I am by no means sure that, in this case, the majority is perfectly right. I think the comparative profits returned by both industries are not studied with sufficient exactitude. I fear that too much importance is attached to the money realised by the sale of cheese, and too little to the returns made from butter, not only in money but in skim-milk for the stock, especially to young stock.

Well, I trust that before this meeting closes, some one will be found to give positive figures on this point, and tell us which is the more profitable of the two.

I should be inclined to believe, in certain cases, that it would be better to combine the two; to make cheese when cheese sells well, when there is reason to believe the market will be advantageous, and to make butter when the market smiles propitious on that article.

Another calculation to make is this: how are we to feed our cattle so as to obtain in both of the above cases the best results?

I do not think I am wrong, gentlemen, in saying that in the majority of our country places, we have, even already, too many cheese-factories. At present, this is not so hurtful to the patrons as to the manufacturer himself; but to bring about the prosperity of any industry, every one concerned in it must find his profit in it. Thus, I see in the neighbourhood in which I live, factories have largely increased. I see in parishes of no great size and not able to produce a large quantity of milk, two or three factories. I say that this is not an advantage to the manufacturers, neither do I think it is to the patrons.

I heard it said, just now, that the manufacturers ought to have capable people in their service, or to be capable themselves; that they ought not to grudge a high salary to their cheese-makers. Very good! In order to follow this advice, which is certainly excellent, the proprietor of the factory must receive sufficient encouragement from the patrons. If they do not afford him enough milk to enable him to pay good salaries to his men, he cannot make a free choice of them.

Up to the present, this is how the patrons have argued: The less distance we have to cart our milk, the greater will be our advantage. Here, I think they are wrong, and I especially invite those whose mission it is to busy themselves in this industry, to give their opinion on the matter.

I believe that one factory in each parish is nearly enough. It is true that certain of the patrons will have a little farther to cart their milk, but if those who supply the milk would agree to cart their milk in turns, this

would not be a great trouble, and I am persuaded they would find their advantage in it, because they would be able, as the president advised, to pay their men higher salaries, to ensure a better class of workmen, to make a better quality of goods, and would get higher prices and greater profits.

We are now menaced with serious competition in agricultural products, not only by neighbouring countries, but by that newly established part of our own country, the North-West. The price of wheat has already fallen, and the price of oats has been considerably lowered. From the Americans we have maize for next to nothing. Look at our own West, which last year lowered the price of our oats and now is sending very low-priced wheat; it is now going to send us meat in abundance. Breeding, except under very favorable conditions, will be ruinous to us. Such facts as these ought to induce us to improve our farming, and even to carry it to perfection, for unless we do so we shall be unable to sustain a competition with the States and with that country of which I was just now speaking.

Thus, gentlemen, we need reflection, foresight, method, a well grounded determination to make the best use of the advantages we possess in this country; otherwise, ruin stares us in the face. We shall not be able to contend with our fellow-countrymen in another part of the land, and we shall become poorer and poorer every day. Nay, we may be obliged to leave our homes for other more favored parts of the country: even to become exiles!

Nevertheless, all is not dark here. We possess advantages in this country; only these advantages, if we are to derive the greatest possible profit from them, demand a little more industry, a little more foresight, more reflection, greater determination to do well, than we have hitherto shown. If we determine to do better, we can contend successfully not only with the United-States, but with our compatriots who are engaged in opening up the great territories of the West.

Gentlemen, I said last year, and I think with great truth, a farmer needs as much reflection to conduct his business, to manage his work, as a diplomatist needs to direct the affairs of his country. A farmer needs to employ as much foresight to conduct his work in the most advantageous manner possible, as an advocate needs to plead the most important cause. As much intelligence is needed by the farmer to carry on his business succesfully, as is needed by the doctor, the shopkeeper, by any professional man whatever, to manage his affairs, no matter how complicated they may be. I said more, gentlemen, and I will repeat what I said on this occasion at the risk of scandalising some one: as much foresight is required in turning a dungheap, as in writing a diplomatic letter, always presuming that you

turn your mixen in such a manner as to gain from it all the profit you can expect.

It is not perhaps wise to repeat oneself so often, but I said this last year and I repeat it now, and I confess that I am so well persuaded of the correctness of my argument, that I do not think I am wrong in repeating it on this occasion.

Besides, I do not pretend that this I am telling you is anything new, or that it is a discovery I have made; you know all about it as well as I do: but have you borne it in mind every time you have set about some piece of work? Perhaps, in saying and re-saying it as I do, I may induce some one among you to put into his daily occupation all the attention, the foresight, the intelligence he is endowed with.

Anyhow, if what I said last year has benefited no one else, it has benefited me.

I will tell you what happened to me: I was just in the midst of hay making; I had two machines at work, and everything was going on well. I went into the field and saw that it was all right. There was still a great piece of grass to cut, and I said to myself: we shall soon have done.

In the morning, before starting, my speech at l'Assomption, reported in the *Journal of Agriculture*—and it read much better than it was spoken—had struck of my eye, and I had read it without recollecting that it was I who had made it. Among other things I found there was what I said just now, about all the eggs in the same basket. I went to the field, where I had two machines at work on a great extent of hay that I had intended to finish that day.

But, reflecting on what I had read, I said: "If I cut the whole piece, I shall be putting all my eggs in the same basket; I think I had better keep some for to-morrow."

I stopped the machines, and waited. The next day it rained in torrents. If I had not read my speech, I should have cut all my hay, and the next day's rain would have drenched it.

As I have had no opportunity of preparing an address, it is high time I should give up my place to another who may speak to you in a more scientific and interesting way.

Lastly, let me tell you that he who makes two ears of wheat grow in place of one, is working not only for the benefit of his family, but also for the exaltation of his country.

Here, gentlemen, are the two aims that every one should have. I trust that we shall all work together for the attainment of such desirable ends.

ADDRESS OF THE HON. W. LAURIER.

Mr. President and Gentlemen :

That is a wise maxim which advises us to speak only on such subjects as we understand : this is enough to show you that you must not expect much from me.

It is not the first time I have spoken in this hall ; for twenty years I have been speaking here at times, but every time I spoke it was about law suits (*chicanes*), and I must say, perhaps to my shame, I felt myself on much safer ground than if I had been speaking on farming.

Still, if I do not feel competent to speak about agriculture, it is not because I do not appreciate its importance. I was still a schoolboy when I first heard that saying of the good King Henri IV, that he wished every peasant had a fowl in the pot every Sunday ; at the same period, too, I learned the reply of Sully, his minister, that: « The pasture and the plough are the udders of France. » What is true of France is true of all countries ; there can be no prosperity in a country if the farmer-class is not prospering

Now, although I do not pretend to understand these questions, at the risk perhaps, of offending some of those who hear me, I will express my opinion that there may still be some improvements to be made in the province of Quebec. I do not believe that we have as yet attained perfection, and as some king of Macedon, I think it was, used to say : as long as everything is not done, nothing is done.

When I was younger, and perhaps wiser, I attended to only one thing: my profession. That may be the cause of my not having so much wisdom as I ought to have. I used, when younger, to attend the courts of law in Sherbrooke, and regularly, every evening, a little Englishman, a perfect specimen of the true *cockney* from the banks of the Thames, used to pay us a visit. He was well known, especially to the advocate's clerk. As soon as the clerk saw him, he used to give him a glass of beer, and a second, and a third. When the man left, towards midnight, he was as happy as a prince.

But, when he was at his fourth or fifth glass, he used to begin to abuse the French-Canadians. They were bloody Frenchmen, ignoramuses. And why, do you think, he insulted the French-Canadians in this fashion? He told me the reason every time I saw him.

When he arrived in the country, he had seen an advertisement from a notary of the sale of a farm, in consequence of a law-suit. The advantages of the property were enumerated, its fertile soil, etc., etc., and among other advantages it was mentioned that, the cowsheds being built on the banks of the river, the dung could be easily thrown on the ice during the winter, so that the water would carry it away in the spring !

The idea of getting rid of the dung by throwing it into the river shocked this Englishman, and made him entertain such a bad opinion of the French-Canadians; an opinion which he held till his death.

To-day, I can give you the opinion of another Englishman, Mr. Fisher, of Brome. He is a man whose example might be followed with advantage by many people. He is a physician, and very rich; he was reared in luxury. Educated in England and Germany, he returned to this country at the age of 21, and when his father asked him what profession he wished to follow, he replied: that of a farmer. Observe that Mr. Fisher is so well off that he could live without doing anything (*canne à la main*), or, as I have heard it expressed here, he was twice as rich as he needed to be (*il pourrait déclarer deux fois fortune*). But instead of that, he bought a farm at Brome and took to cultivating it.

His neighbours, knowing his wealth, began by calling him a *kid-glove farmer*, but, when they saw his work, they were forced to retract their words and soon saw that he was a practical farmer.

Two years ago, Mr. Fisher visited Ste. Thérèse. He went over four or five farms there; I am sorry I do not know the names of their occupants.

MR. BARNARD.—M. Dion, one of them, is here.

M. LAURIER.—True enough, I remember M. Dion's name. Well! Mr. Fisher said that he had seen something in England, France, and Germany, but he had never seen better cultivated farms than those just mentioned.

There has been progress made, then, since that young Englishman expressed such a bad opinion about the French-Canadians, seeing that one of his countrymen can say that he never saw better farmed land than M. Dion's, a French-Canadian's. I did not know that he was present, but I am happy to be able to pay him such a compliment.

There is good reason why agriculture should be encouraged:

In the first place, the times are no longer such as they were when it was thought that it was enough if a farmer could hold the stilts of the plough. It is my belief that no business requires more headwork than the farmer's. The reason is plain: in no other business is competition so keen.

In the present state of society, there are liberal careers in which competition acts on a great scale. In these, the man who gives his best attention to them succeeds the best; but for one professional man there are a hundred, nay, a thousand farmers.

The career, then, of the farmer is necessarily that in which competition plays the greatest part. Show me the farmer who works not with his hands alone, and I believe you will have shown me a prosperous farmer. On the other hand, show me a professional man who is satisfied with follow-

ing the routine of his occupation, and, depend upon it, he will not prove to be a successful man in his profession.

So it is with everything; and, in my opinion, more so in agriculture than in any other career, because a keener competition exists in it than in any other business.

Mr. President, it is especially from this point of view that I approve, not that my approbation is worth anything, but, since you have invited me to speak, I will say that I approve of associations of this kind, where agricultural questions are discussed. Light gushes forth from discussion. If I were to reproach you, do you know what I should say? I should say there are not enough of these societies. I think there ought to be many more.

I have had occasion to traverse almost the whole of Ontario. Well! there is no municipality throughout that province without its *Farmers' Institute*, and I have more that once seen in the leading papers of Toronto, the *Globe*, the *Mail*, and the *Empire*, reports of the discussions of the farmers' clubs of the farthest concessions of Huron and of Algoma which displayed, in spite of their recent establishment, a perfect acquaintance with the subjects discussed.

For it is not the working of the land alone that interests the farmer. He should know not only how to cultivate the soil, but also how to choose the crops that he should grow, and the style of farming that will be the most remunerative. The products of farming are not always the same, neither are they all equally profitable. There was a time when nothing but wheat was grown in this province. We have lost this crop; it passed over into Ontario; that province has lost it in its turn: Ontario farmers no longer grow wheat, as they cannot compete with the wheat-growers of the West.

You have devoted yourselves, gentlemen, to the manufacture of butter and cheese. I believe that you have entered on a most useful pursuit. I am not a judge of these questions, but I know no branch of agriculture likely to pay better than dairying.

Still, in my opinion, this is not enough. I have always been a lover of horse-flesh, and I believe that horses will pay the farmer better than anything else. Give me a good horse, sound on all four legs, and weighing 1400 pounds, and he will always fetch $150.00.

I have seen M. Beaubien's horses, and I have nothing to say against them, except that they are too high-priced; if they were not, I believe he would have left one to-day in the county of Arthabaska.

In any case, I believe there are more certain profits to the farmer in this branch than in any other.

It may be I am speaking as a blind man speaks of colours....

MR. BARNARD.—No, no; you are right.

M. LAURIER.—At all events, I have given you my ideas; they are based on comparisons I have had occasion to make.

Lastly, to tell you my thoughts fully, if the valley of the St. Lawrence were farmed as it ought to be, there would not be in the whole world a country fit to be compared with it. The Canadians are not such good farmers as they ought to be. I do not say it is their fault.

MR. BARNARD.—They will become so.

M. LAURIER.—I am sure they will. The slowness of our agricultural progress is easily explained by history. After the conquest, all our powers were concentrated on one point: the preservation of our nationality. This is now ensured. Let us betake ourselves anew to the development of our agriculture, and our success will be complete.

SPEECH OF M. BERNATCHEZ.

Gentlemen,

You did not give me a chance, this morning, of protesting against the resignation of M. de La Bruère who has presided over this association up to the present time with so much distinction and devotion. The services he has rendered to the association cannot be appreciated highly enough.

I regret the determination he has come to; he has all the qualities necessary for the worthy discharge of the position, while his successor comes to it with little knowledge and experience.

But, since you have kindly conferred this honour upon me, I feel too much flattered not to accept it.

I reckon, moreover, to help me in fulfilling the duties of my office, on the aid of our amiable and intelligent secretary, and on you all, gentlemen, who, for the most part, would have discharged far better than I the duties of the post I am called upon to occupy.

I shall do my best to aid this association in forwarding and popularising the best methods of farming.

THE FEDERAL EXPERIMENTAL FARMS.

By M. J. A. Chicoine.

Mr. President,

From the very first organisation of the Dairymen's Association of the Province of Quebec, I have followed its labours with the greatest interest and the greatest benefit. The lectures and discussions which have distinguished its meetings, and which have been so opportunely published, constitute a new epoch in the diffusion of agricultural information in this country.

At this, the first time of my being present at any of its deliberations, I feel it my duty to congratulate the founders of the association on the patriotic enterprise they have undertaken ; an enterprise which has been carried out with a devotion and success worthy of all praise.

In spite of my admission to your ranks only dating from yesterday, you have condescended to ask me to address you. Flattered as I, of course, am at this mark of your good-will, I still am obliged to solicit your indulgence.

The subject I am about to treat is so vast, and embraces such a number of details, that it is difficult, not to say impossible, to find room in an ordinary lecture for a description in full of the *Experimental Farms of the Dominion* in all their importance and under all their different aspects.

These establishments, of quite recent creation, have already been so largely developed that it would take hours of talk were I only to sketch before you the operations of the Central Farm at Ottawa, the one that more specially concerns us.

My essay, then, will be limited to the pointing out of certain striking features, to tracing the chief points of interest to be met with, and to attracting your attention to a subject which I shall only skim over.

I am happy to think that in striving to extend the reputation of the Experimental Farm established in the suburbs of the Federal capital, for the common benefit of the two provinces of Ontario and Quebec, I shall meet with the approval of all the friends of progress, and more especially shall I second the intentions of the Hon. John Carling, Minister of Agriculture, who is particularly desirous of seeing our compatriots more interested in the object and organisation of this institution. Mr. Carling, during his long career as a public man, has always loved and favoured agriculture, and the Experimental Farm is now his most dearly loved work: to it he devotes not only his official attention, but also a great portion of his leisure.

I

Agriculture is essentially a *matter of fact* business, and the further it is removed from the abstract methods of speculative science, the greater will be the benefits derived from it. There is nothing positive or defined in the art of cultivating the soil ; the various changes of climate and locality govern everything connected with it ; the inconstancy of the elements, and the more or less mysterious caprices of nature, must all be reckoned with.

Experiments, then, must form the very basis of agricultural knowledge. All the progress heretofore accomplished is the fruit of *experience*, and if we wish to convince the farmer of the value of a new process or of the utility of any suggested improvement, we must refer him to the logic of facts and to the results obtained from them.

It is clear that the different discoveries in the art of agriculture are due to observation.

Before man learned the art of cultivating the soil, his life was that of a shepherd or grazier. The almost universal worship of the bovine race in the antique world shows that dairying is coeval with the creation.

Among the plants gathered for the food of their flocks and herds, the shepherds remarked some, the seeds of which, when scattered about round their cots, germinated and bore fruit. Hence, the first ray of light thrown upon the fact of reproduction from seed, followed quickly by the discovery of the nutritive value of cereals. Observing that the spots where their herds had rested were improved in fertility, they learned the value of manure. And so of the necessity of allowing land to lie fallow, as well as of the advantage of a rotation of crops ; both of which were indicated from very early times by the evident poverty of land subjected to too frequent cropping.

Experimental agriculture, as long as it was left entirely in the hands of private persons, could only procure slow and partial results. More than one experimenter has been ruined by his love of progress, and statesmen have at last come to feel that it is the duty of the public authorities to bear the weight of this kind of investigation, so important is it to the nation. Now, in every country where agriculture is valued and held in honour, we see the creation of establishments devoted exclusively to the making of trials and experiments for the common good of the agricultural classes.

These laboratories are called *experimental farms*. It is only of late years that the different governments have taken these institution under their immediate care ; but we learn that in our old mother-country, the good king Louis XVI, as long ago as 1783, established at Rambouillet, a few leagues from Versailles, an experimental farm, whither he was wont to repair for the purpose of escaping from the cares of royalty. To the prac-

tical experiments at this farm, France is indebted for the origin of a race of sheep which is still in high repute there. We know that, about the same date, Parmentier, under the patronage of that powerful, but, subsequently, unfortunate monarch, carried out experiments on the potato, which, by destroying the prejudice which up to that time had rigorously excluded it from the list of French comestibles, won for it an introduction to the general table.

To-day, experimental farms are kept up by all European governments as well as in the different states of the neighbouring republic. As a French agriculturist, M. P. Joigneaux, writes: *Their utility is indisputable. Farmers can no more dispense with their aid than the services of a physician, in cases of sickness, or of a lawyer, in cases of law, can be dispensed with.*

During the parliamentary session of 1884, a special committee was appointed to enquire into the best means of encouraging the development of the agricultural industries of Canada. After consulting with the principal *agriculturists* of the country, and even with some foreigners, this committee presented an elaborate report—March 21st, 1884,—in favour of the establishment of experimental farms in the different provinces of the Dominion. This report, signed by M. G. A. Gigault, M. P. for Rouville, met with the general approval of both political parties. (1)

In the session of 1886, two years later, parliament passed, unanimously, a special law providing for the creation of this farms, and defining their plan of operation-

II

The object of the Experimental farms cannot be better explained than by reproducing the words of the Act establishing them:

(*a*) To make investigations and to verify experiments for the purpose of discovering the relative value, in every respect, of the different breeds of cattle, &c., and of their adaptability to the different conditions, climatic and otherwise, which obtain in the several provinces and in the N. W. territories.

(*b*) To study the economical questions that belong to the production of butter and cheese;

(*c*) To prove the merits, the hardiness and the adaptability of new or hitherto untried varieties of wheat and other cereals, of field-crops, grasses and fodder plants, of fruits, vegetables, plants and trees, and to distribute among people engaged in farming, in horticulture, or in fruit growing, under conditions to be prescribed by the minister, samples of the products which shall be considered specially worthy of introduction;

(*d*) To analyse natural and artificial manures, and to experiment on their effect, in order to show their comparative value when applied to different crops;

(*e*) To study the composition and digestibility of the foods given to domestic animals;

(*f*) To make experiments in the planting of trees, whether intended for building purposes or for shade;

(1) *Agriculteur*—a farmer; *agronome*—a scientific farmer. Trans.

(*g*) To investigate the diseases to which plants and cultivated trees are subject; the ravages committed by destructive insects, and to make experiments to prove what are the most efficacious means of preventing and remedying these injuries in each case.

(*h*) To enquire into the diseases of domestic animals.

(*i*) To test the vitality and purity of agricultural seeds; and

(*j*) To make all further experiments and investigations connected with Canadian agriculture, which shall be approved by the minister.

As we saw above, the plan was intended to embrace all parts of the Confederation. This provision of the law has been observed: in the province of Nova-Scotia, a farm has been founded, at Nappan, for the Maritime Provinces; another at Brandon, Man.; another at Indian Head, N. W. T., and one at Agassiz, B. C.; but the principal station is the Central Farm at Ottawa. This last is our chief concern, as it is intended to exert its influence over the farmers of the Province of Quebec.

The extent of the important central station is 466 acres. It is situated on the outskirts of the city of Ottawa, and occupies a gentle declivity, whence one has a splendid view, not only of the Federal capital, but also of the picturesque country in its neighbourhood both in the province of Ontario and in that of Quebec. The soil presents that diversity necessary to the practical working of experimental agriculture. All sorts of soil are present, from heavy clay down to light loam.

The short space of time that has elapsed since its foundation has not allowed this establishment to attain to what may be called the pitch of perfection. Part of the land had to be cleared; buildings had to be erected; implements, both common and special, had to be provided, and the plans of operation to be laid down and combined. Still, the visitor will be agreeably surprised at the high degree of organisation and the perfect state of working which have been secured in so short a time. The fact is, that the Minister of Agriculture has been very fortunate in his selection of the persons entrusted with the management of the farm. They are men thoroughly competent in their several departments, and have been chosen for their merits alone. It may be said, in this case with truth, that *the situation has sought the man, and not the man the place.*

Thoroughly equipped in every point, the central farm has now seriously and practically entered upon all the phases of experimentation.

A great variety of trees, of shrubs, and of fodder and leguminous plants, many varieties of grain, the improvement and introduction of which are considered useful to Canada, have been already cultivated there in a careful and judicious manner, and compared with each other.

The chemical laboratory is in full work, and is doing good service to the farmers. At their request are analysed products, artificial manures, and

all matters a knowledge of the chemical composition of which may aid and interest the agricultural public.

A short time ago, a French colonist of the Eastern Townships, who is in the habit of examining with care and intelligence the soil of his farm, was anxious to know what percentage of carbonate of lime it contained. He sent a sample of the soil to the experimental farm, by post, and, a short time afterwards, received, by the same route, an elaborate report which gave him ample satisfaction.

Last winter, many farmers had recourse to the farm for the purpose of testing the germinating value of the seed offered for sale by the Montreal and other dealers ; and this facility offered to all of controlling, free of cost, the quality of their seed, has already had the effect of putting many seedsmen on their guard, and will hinder the perpetration of many abuses.

Special attention is given to the cultivation of fruit-trees. Varieties from Russia and other cold climates have been and continue to be imported. As soon as the value of any species is sufficiently proved, and when no doubt remains of its acclimatisation in our country, its general adoption here will be recommended ; and more, a gratuitous distribution will be made of cuttings and grafts for the purposes of propagation.

III.

Here is one praiseworthy side of the experiments as conducted by a government : the experiments being conducted solely for the sake of instruction and to show the utility of any novelty, it has no interest in boasting about them, or in taking credit for them. Having neither the idea nor the wish to make a speculation out of them, a source of profit, it is not tempted, as a private individual would be, to brag out of all reason, and often prematurely, about the success of its enterprise.

What mistakes, will our honest and sometimes too confiding *habitans* avoid! Four or five years ago, a man from the neighbourhood of Boston drew thousand of dollars from the pockets of our farmers by selling them young apple-trees, the fruit of which was to surpass anything that had then ever been seen in this country. His promises and demonstrations led to the planting of several orchards, the leaves of which, during the first two years, gave hopes of success ; but the rigours of our winters soon played havoc with these exotics. The nurseryman might have been acting in good faith, but he was not the less a cause of injury and discouragement to those who, like himself, were not aware that our climate resembles that of Siberia rather than the climate of Massachusetts.

A few years ago, a travelling agent went through the country with vine-plants which were to do marvels. Each farmer could plant a vineyard

without trouble, the richest grapes were to be gathered in abundance, and the cellars were to be full of generous wine. Unfortunately, this rival of the Boston nuseryman succeeded in selling an immense number of his plants, and, like the other, he made as many victims as he had customers. The intrinsic qualities of his vines may have been excellent, but, not being adapted to our climate, they perished miserably at the first attack of the frost.

And, still, the vine is grown and capital wine is made in climates as severe as ours. The truth is, the wild-vine flourishes everywhere in our virgin forest. The illustrious Jacques Cartier could not conceal his admiration at the sight of the grapes growing on the Isle of Orleans, which he, on that account, named the Isle of Bacchus.

At the experimental farm, special attention is given to vine-growing. At present, 150 varieties of grapes are cultivated experimentally, and it is proposed to add a great number of other sorts. As soon as the practical value of any sort is settled, whether as regards the fabrication of wine, or as a simple dessert-fruit, it will be distributed gratuitously among the farmers.

Especially are efforts being made to improve the cultivation of cereal crops. Since our summer is so short, it is of the greatest importance that only the most precocious sorts should be grown.

The farm-director, making use of the consular agents of the British empire, procured grain grown in climates analagous or even severer than our own. Thus, in 1887, a variety of wheat grown near Lake Ladoga, in the north of Russia, was imported. The latitude of that place is 840 miles north of Ottawa, and 600 miles north of Winnipeg. For three seasons, this Ladoga wheat has been grown at the central farm and its branches, as well as by a crowd of private persons, to whom samples have been sent for the purpose of experiments, which, up to to-day, prove that the Ladoga ripens, on an average, ten days earlier than our most precocious wheats, such as Red Fife, White Russian, &c. This is one of the most important operations. If, as everything goes to prove, this wheat be definitively introduced into our system of cultivation, it will render us such service that it alone will suffice to pay for the whole expenditure incurred up to to the present time by our experimental farms. A Scotch farmer, of Manitoba, told me lately that a ten days earlier ripening of wheat would have the effect of doubling the certainty of the harvest of that province, and would, besides, render possible and profitable the breaking up of millions upon millions of acres in the more northern part of our territories.

The official statistics of the ministry of agriculture show that the brewers of Great-Britain import annually from abroad 40,000,000 bushels of barley, in addition to what they buy in their own country. Now, out of this immense quantity of barley bought abroad, do you know how much Canada

supplies? The confession is almost heart-breaking when one thinks of the extent and fertility of our land: we only sent out, last year, the trifling quantity of 1,600 bushels. Hardly two car-loads!

Considering the facilities of production we enjoy and our closely linked commercial connections with the mother-country, this fact is almost phenomenal! Still, it is easily explained, when we consider that we do not cultivate the varieties of barley which the English brewers prefer. Brewing is carried to perfection in England. Visit any part of the known world and you will find that English ales are valued and consumed there. To the care taken in their manufacture is their reputation due. Now the selection of the barley is a part of this care, and it plays a great part in the quality of the malt. English breweries use exclusively 2-rowed barley.

The farm manager sent at once for samples of 2 rowed barley, selected from the sorts most in favour among maltsters, in order to introduce its cultivation into the country. These selections have answered perfectly, and from all appearances in a very short time our Canadian farmers will be able to supply a part of the above mentioned immense market which to-day is, so to speak, closed to them. A variety of *beardless* 2 rowed barley, from Reading, England, has been grown, this summer, at the central farm, and succeeded well, yielding 50 bushels an acre. Another kind, sent by the Royal Agricultural Society of Denmark, which country exports a great deal of barley to England, has been sown at the Indian Head farm. Less in yield than the preceding sort, it excels it in weight and quality.

In order to thoroughly understand the bearing of this proceeding, we must bear in mind that the average price of our ordinary export barley has been, for the last ten years, 71 cts the bushel; while the average price of *malting* barley in England, during the same period was $1.30. Allowing the extreme cost of the Atlantic voyage to be 12 cts. a bushel, a balance remains of 47 cts. a bushel as an encouragement to us to open as soon as possible this new road to our agricultural prosperity.

We remarked that one of the objects assigned by Parliament to the experimental farms was the investigation of *questions belonging to the production of butter and cheese.* This part of the programme has not been neglected at the central farm at Ottawa. A fairly numerous herd already exists there, including representatives of the principal breeds of cattle, and experiments are being made on their respective properties as regards the production of milk and of butcher's meat. The value of plants relatively to the quantity and quality of milk is also the object of careful and methodical enquiry. This summer, a silo has been built, and 70 varieties of ensilage-corn have been grown, with a view to the discovery of the sort that yields

the best crop and is at the same time the best suited to the production of milk.

Again, for the advancement of the dairy-industry, numbers of trials are being made with different grasses, native as well as foreign, for the sake of improving our artificial meadows and encouraging the laying down of permanent pastures. An experiment has been begun in growing crops for *green-fodder* for cows in summer. It is intended that great attention shall be devoted to this division of the operations of the establishment.

IV.

I shall not insist on the services which the experimental farms are so clearly in a position to render us. Their usefulness, admitted as it is by all agronomes of to-day, cannot be doubted by the enlightened part of our farming population.

Still, one may doubt if our compatriots in general have taken a sufficiently earnest interest in the organization and the aim of an institution founded expressly for the advantage of their province. When we study the list of persons who have visited the central farm at Ottawa, who have been in communication with the staff, or who have tried to take their part in the experiments carried on there, I confess with regret that the names of farmers of the province of Quebec do not appear very frequently in it.

Our educated men, our men of influence, might do immense good by employing themselves, each in his own sphere, in awakening the attention of their fellow-citizens, and in exciting them to rival the zeal of the inhabitants of the other province, in the study and observation of the work at the central farm.

Let us make no mistake: the agricultural question seeks for, now, perhaps, more than ever, the assistance of calculation and study. The trades of our towns, while insuring us a market, carry on a terrible war against us by attracting our rural population, and inducing them to resort to the towns by the offer of high wages. The only way to stop this movement, which seems to be assuming dangerous proportions, is to lead our farmers to the employment of new methods, more paying systems, in order to re-establish the equilibrium between the wages of the farm and the wages of the factory

It is all very fine preaching about the nobility of agriculture; to talk about the Romans entrusting the guidance of the State to a simple ploughman; to quote the poets who have sung the blessings of the life of the farmer; all this will go but a little way towards restoring the courage of the husbandman, towards renewing the severed bonds which attached him to his business. Instead of warbling sentimental songs in his ear, let us show him by the results of judicious and unbiassed experiments how he may

double the yield of his crops, how he may increase his revenues. When his sons come to see that the gains of the farm are as good as the wages of the work-shop, they will remain attached to the family farm and will desire no other road to prosperity.

Instead of trying to persuade the routine-farmer that he is another Cincinnatus, let us try to lead him to have recourse to the teachings of experience, to induce him to accept those improvements which the necessity of the times render obligatory.

If the manufacturer can afford a liberal remuneration to the workman, it is because he has known how to perfect and to keep on daily perfecting all means of production. He has had recourse to the inventions of science to replace the muscular force of man by the forces kept in reserve by nature. Not satisfied with turning aside the course of rivers to convert them into motive-powers capable of multiplying the power of the arms of man, he plunges into the very bowels of the earth in search of fuel to produce steam, that marvellous cause of our economical revolutions.

Following the example of the manufacturer, the farmer must perfect his means of production. He must use the resources of intelligence to increase the power of manual labour. He must learn how to get his share of the elements held in reserve for him since the creation. Like the manufacturer, the farmer must no longer be satisfied with the common style of work, but avail himself of the mineral manures which our mountains conceal in their sides in such immense quantities and so easy of access. Our quarries of limestone and apatite form a powerful aid to our agricultural progress. It is a certain fact that these manurial matters are, of themselves, a means of working such a revolution in farming, as steam has caused in manufac turing operations. And the consideration of this prospect has by no means escaped the observation of the director of the experimental farm. Hardly one experiment in cropping has been undertaken without the employment of chemical manures having some effect on the results. There is no better way of making them popular than this.

The chemical composition of plaster was long known before it was used as manure. Learned men know that, theoretically, it entered into the formation of plants; but it took an accidental *experiment* to bring into notice its fertilizing powers. It is related that a German working-man, employed in a gypsum quarry, had to traverse, in going and returning from his work, a narrow path across a meadow. The herbage close to the path was observed to flourish more than the rest of the meadow, and the beneficent action of the gypsum shaken from the clothes of the workman as he passed having been judged to be the cause, plaster quickly became the favourite manure of the farmers of the neighbourhood. All the world knows how Franklin,

by aid of an argument drawn from an experiment, succeeded in making plaster appreciated by his fellow-countrymen.

But people will say, how are we to study and follow out the operations of experimental stations so far from our homes and embracing so many and such varied experiments ?

First of all, you must know that each undertaking, each crop, each proceeding, so to speak, is carefully inscribed and marked in separate registers. The facts and observations are so classified and arranged that, by writing to the manager, it is very easy to obtain any required information. As to the general methods of the establishment, that can be satisfactorily followed by means of the «Bulletin», which is published periodically, both in French and in English, and sent gratuitously to all who ask for it.

Letters and samples, &c., may be sent post-free, to : The Director of the Experimental Farm, Ottawa.

I stated, just now, that the farm had not yet arrived at the pitch of perfection. It is very sure that its usefulness will largely increase with time ; but, even in its relatively embryonic state, the intelligent farmer will find after his visit that he has profited by what he has seen, and has gained valuable knowledge and ideas from its inspection. A gardener from Western Ontario writes that three hours spent at the farm paid, in knowledge gained, for all the cost of his journey thither. Why should not a farmer from this province be equally benefited by visiting this establishment ? If the sight alone of the farm-station pays his expenses, he will have the opportunity in addition of a gratuitous sight of the architectural as well as the natural beauties which adorn the Federal capital and its neighbourhood.

Our various societies, the agricultural associations and clubs, might easily assist in this by offering to their members the means of keeping themselves well informed as to the work of the institution, a very weak and imperfect description of which I have just laid before you.

M. l'abbé Montminy said, last year, at the meeting of the Dairymən's Association :

Agricultural clubs are powerful promoters of the establishment of butter and cheese-factories, and, consequently, valuable assistants to our Dairymen's Association.

This testimony, coming from a man who has himself attained to wonderful success by and through the means of an agricultural club, should urge each of us to do something towards increasing the number of such associations in the district he inhabits.

For my part, I should like to see every place have its club, the officers of which should be in communication with the experimental farm. At the

regular meeting, the « Bulletin » might be read, discussed, and argued about.

More than that ; I could wish that the club might agree with the railroad companies to give the members, desirous of visiting Ottawa, tickets at a reduced rate. Very moderate fares are charged to excursion parties going to a lacrosse match, to races, circuses, and other amusements ; why should not the same advantages be offered to our agricultural classes who travel for the purpose of instruction and of advancing themselves in their business. Are not railroads deeply interested in the material progress of the country ? Does not everything that tends to augment the amount of the national production, at the same time tend to augment their receipts.

In conclusion : Farmers of the province of Quebec, it is in your interest that the Government has undertaken this experimental work ; it is from the public funds that it has been organized, directed, and maintained. This money has been voted by your representatives in Parliament with the praiseworthy view of promoting the progress of agriculture ; but, in order that these sacrifices may be useful to you, your intelligence and good-will must support these establishments.

As far as you are concerned, the success of the experimental farm is in your hands.

THE PROVINCIAL AGRICULTURAL LABORATORY.

BY M. L'ABBÉ CHOQUETTE.

Mr President,

Mr. Commissioner of Agriculture,

and Gentlemen,

I accepted with delight the invitation of our devoted secretary, as an excellent occasion of making known to the agricultural class the establishment, at St. Hyacinthe, of a provincial experimental station, and the end at which the station must aim in order to enter into the views of the Government.

I saw on the programme of this meeting that you would shortly be enabled to listen to a lecture on the organization and the working of the experimental farms established by the Federal Government ; and this will, fortunately, simplify my task. I shall not insist upon the utility, the necessity of these stations, but I will simply tell you, briefly, what I, in my capacity of chemical-director of the experimental station of the province of Quebec, intend to undertake in the interest of agriculture in general and of the dairymen's association in particular.

Without being completely fitted up, my laboratory is now sufficiently furnished to enable me to undertake chemical analyses. I have already studied and determined the relative value of seven varieties of maize sent me by order of the department of agriculture, and I have also analyzed, at the request of Colonel Rhodes, the Capelton superphosphate.

In a few days I shall begin enquiries into siloes and ensilage. In this matter, there is a whole series of problems the solution of which is urgent. On casting one's eye over the different samples of ensilage exhibited at the entrance of this hall, it is easy to see that all farmers are not equally successful in preparing an appetizing food. All, however, I am convinced, do their best to fulfill the conditions enumerated and repeated so often in the lectures and discussions which have taken place in former meetings of this society. But, it seems clear that, with the same care and pains, sometimes a sour and sometimes a sweet ensilage will be produced. The heat, to which so great a share in the fermentation of maize is attributed, is not sufficient to explain these variations. Must we seek, as M. l'abbé Chartier suggests, in the more or less advanced state of ripeness the secret of producing sweet and odorous ensilage? It is very possible. However that may be, I hope this year to make the investigation of maize and ensilage the chief work of the station. M. Louis Beaubien, whom we have just heard, puts the number of siloes now built in this province at 2,000. If I can lead the farmer to realize, whether by the method of cultivation or by the mode of preparation, a saving of ten cents for every ton of ensilage, I think the station will have done a good work, a work that, if it stood alone, would justify its establishment. It is with this view that I made the analyses of the maize I just mentioned, and it is for the same purpose that I shall examine the fifteen or twenty samples of ensilage that I have asked the Government to send me. Which is the best maize for the silo? There are foreign varieties that grow fourteen or fifteen feet high, and are full of water; up to 60 o/o to 70 o/o of their weight. Are they preferable, taking into consideration both yield and nutritive value, to our Canadian corn? It is in the laboratory that I shall determine the richness of these plants, but the yields the field must show. To arrive at this knowledge I am assisted by a fortunate incident. Three intelligent farmers, near St-Hyacinthe, grow ensilage maize under totally different conditions, on the relative merits of which agronomes are at odds. One sows the Southern maize in hills; he cuts it green with the ears hardly formed. Another sows horse-tooth corn broadcast; I need not say that this bears no developed ears. The third sows the latter named corn in rows, and cuts it when the grains are formed and begin to assume consistence. All are satisfied and hold tenaciously to their plans. For my part, I shall have Canadian corn sown.

I shall wait to harvest it until the grains are glazed, in accordance with the practice of American farmers, who cry out against cutting maize before that stage of growth. To complete the experiment and render discussion possible from every point of view, I shall do this: in a small field, which I shall call the experimental garden, the soil of which is uniform, I shall cultivate, each according to the three modes of sowing in use nowadays, the four sorts (3?) of maize I have just mentioned, and every other sort that may be kindly pointed out to me as able to contend successfully with them. And more: as maize demands a great quantity of manure and is not indifferent to the action of the several different constituents of which it is composed, I shall furnish to one and the same variety divers natural and artificial manures, the efficacy of which I shall carefully note. By these means, it seems to me, I shall have in hand all the points necessary for the solution without dispute of several questions relating to ensilage.

I hope to be able to give you next year positive results from the experiments. Still, let me tell you, I shall be slow to arrive at a final conclusion. The Southern and the Western corn will do wonders in a warm and rainy season, while the Northern sorts will hardly develop themselves, and *vice-versâ*. If the experience of one year is not enough, I shall repeat it until the results come out consistent and definitive.

I said above, that I wished to study, if I could get leave, the results of the practical cultivation of the three neighbouring farmers. It is on the farms of these gentlemen, therefore, it is under the ordinary conditions of good farming that I mean to compare the merits of those methods which, up to the present time, have not been exhaustively studied except as to the results, not unfrequently misleading, of the *intensive* cultivation of experiment-plots. I reckon much on the earnest aid of farmers in general. I wish to follow up the execution of the experiments they attempt, to collect the reports of the results obtained, and to hand them over, after discussion, to the public.

In editing the general and annual report, a copy of which will, I hope, be sent to each of you, I shall try to translate into simple and easily comprehended terms the scientific discussions and the technical details necessarily introduced into the description of the experiments. I shall also give, as a preface, some notes on agricultural chemistry, to enable the farmer to understand the utility as well as the object of the investigations of chemical analysis, and explain to them the meaning of certain words no longer in common use, the sense of which he can only find in special treatises.

Among other questions I desire to study, and which have been suggested to me either by the department of agriculture or by farmers with whom I

have talked about the work of the experimental station, I will briefly enumerate the following :

1. The analysis of fertilizers sold in our country-districts. A statute of the Dominion Parliament imposes wise regulations on the dealers in these matters ; and it is desirable that we be assured that these rules are adhered to by them.

2. The determination of the nutritive value of the two varieties of wheat-bran now on the market : that produced by the roller-process, and the ordinary sort produced by the mill-stones.

3. Wood ashes : to determine the quantity of potash, phosphoric acid and lime therein contained, according to the source whence they proceed, and to give their commercial value as chemical manures.

4. The rational mode of feeding cattle (it being supposed that the farmer possesses the ordinary materials of food : hay, clover, straw, grain, ensilage, &c., and that he can purchase bran, cake. &c., which he will mix together), furnishes us with the most economical and efficient rations.

5. The proper time to cut hay. I hope to be able to communicate to you before next hay-time the results of an inquiry I have undertaken at the request of a distinguished agronome. I have had taken from the same hayfield five samples cut at different times, from the appearance, that is, of the first flower, and at perfect maturity. These samples, tied up in small ticketed bundles, were placed in the middle of a large bag of hay, and will thus participate in all the modifications which the bulk of hay, which it is intended to compare them with, will undergo.

Analyses of Ensilage—Test of Seed Grain, etc.

I have now to state what the experimental station proposes to do in the immediate interest of the dairymen's association, and the statement does not require many words : it will extend the aid of science to the experiments which the makers of butter and cheese often make—oftener even than they desire—during their operations. I am not initiated into all the secrets of cheese-and butter-making, but I know enough of the reactions that take place in the preparation of these goods to make me suspect that the maker would many a time be very glad to have an explanation of certain phenomena, as well as to know the composition of the cheese and butter he has made under certain exceptional conditions.

At the entrance to the town of St-Hyacinthe, lives a skilled manufacturer of cheese, with whom has lately been associated a maker of butter. This cheese-maker you all know well, since he has been for several years inspector of factories in the province. I am inclined to believe that he thoroughly understands the ordinary difficulties that beset the makers. He

knows, too, the different points in the manufacturing process on which chemical analysis may throw some ray of light. Well! I am willing to undertake, gratuitously, the solution of such questions of general interest as he may be disposed to submit to me, either on his own account (*son propre chef*), or at the suggestion of any other maker. If I reserve to myself the right of refusing to receive matters for investigation of this kind except from one single individual, it is not because I do not desire to be of service to everybody, but to economize work and to avoid all misapprehension.

As to questions of private interest, and the solution of particular questions, such as skimming, watering the milk, &c.; I am willing to make a certain number of gratuitous analyses of everything of the sort that may lead to suits at law. I will talk the matter over with the secretary of the association, and the result shall shortly be communicated to you. I only stipulate that, from to-day, there shall be forwarded to me in every case, with the sample of suspicious milk to be analyzed, a typical sample taken from the vat into which there has been poured at the very same moment the milk supplied by the patrons.

It will also enter into the scope of my work to determine successively, for the different regions of the province, a scale of the variations of milk in its contents of butter and of total solids, according to the months of summer, and the method followed in making it.

Lastly, gentlemen, the director of the experimental station will always listen to and receive with deference any suggestions that farmers may make to him. He reckons on the aid of this association, since he is well aware that it counts among its most active members those who are giving to the agriculture of this province a most remarkable impulse He will be happy if his labours shall contribute to the increase of the fruits of the praiseworthy efforts of the Minister, of the Council of Agriculture, and of the Dairymen's Association, as well as of the intelligent class of farmers in this province.

AGRICULTURAL CLUBS.

BY O. E. DALAIRE.

Mr. President and Gentlemen,

Before entering upon the subject on which I shall have the honour of speaking to you to-day, permit me to effer my congratulations to the Dairymen's Association. Far better than I, can learned economists calculate all the good which your great and flourishiug society has done; but nobody far or near can applaud more feelingly all that can contribute to the agricultural prosperity of the province, and, gentlemen, it is certain that a

large share in the astonishing success of agriculture during the last few years is due to your association.

Nothing is easier to understand, since, as one of your skilful lecturers, Mr. Leclaire, observed so sensibly, your grand association is, as it were, the Agricultural Club of the province. Yes, it is, in very truth, the *Club of Clubs*, the union of all that we have of most practical and most learned in the way of agricultural knowledge.

Gentlemen, I have mentioned the agricultural club; an institution I take great delight in, but I cannot speak of it to you in a general manner, I can only share with you my personal experience, and I shall accept with a good grace all remarks that may be made on what falls from me about it, seeking, as I do, above all things, the general good of my fellow countrymen. The agricultural club, well understood, will prove a powerful aid to the general good, because it reaches the farmer in his own home, which no other means can do. The agricultural club spreads abroad good ideas, useful examples; the negligent farmer blushes at the sight of the success of his neighbours, he is driven forcibly into the right road, and he who was, perhaps, almost in despair, enters upon a courageous struggle against prejudice, routine, &c., and his family, as well as himself, sees better days.

It is easy enough, gentlemen, to establish an agricultural club in a parish; but the question is: *how shall an agricultural club be rendered prosperous?*

In order to do this, those who establish it must be. and must remain, deeply convinced of its moral, economical, and patriotic importance.

Moral; since the meeting together of farmers for the discussion of their common interests rouses them to work more intelligently, more assiduously, and it is from work that success is expected; this work presupposes method (*ordre*) neatness, and good conduct, so many excellences which we delight to observe in men of good character. The clergy, generally, take pleasure in helping these meetings, because they are powerful means of opposing, *by means of dissuasion*, many faults, such as drunkenness, extravagance, want of courage, often proceeding from want of success, the fruit of ignorance, etc. And more, the Abbé Montminy, one of the first and one of the most energetic promoters of the clubs, has proved that a club in active-operation is the best preventive against the emigration of farmers to the towns and the United States.

The agricultural club elevates the farmer-class; not that it is not eminently respectable in itself, but by leading farmers to stand upon their own dignity and to testify firmly that farming requires at least as much knowledge as any other business.

The club, again, brings about unity of ideas, i. e.., it conquers divi-

sions by gently leading the members to take more interest in their common welfare ; there will be more "farming-talk", and less gossip about those thousand little miseries that are the curse of many a parish.

Economical ; since it does not take many improvements in a parish to produce in it thousands of dollars. Take 200 farmers making $50.00 each additional by better cultivation : there you have already ($10,000) ten thousand dollars gained in a year, and these figures may be considerably increased, according to many who know what they are talking about ! The club, then, will enable the farmers to take more surely hold of the benefits to be derived from a well-planned method of cultivation. The superior foresightedness (*calculs*) of some will make up for the want of natural talent in others, and all of them will profit the more from the experience of each.

Patriotic ; because the club makes agriculture, the chief source of wealth in our country, to be loved ; because it retains the young on Canadian soil by the assurance of a career better appreciated than formerly. The sad and obscure condition of certain farmers has often induced young men of talent to carry their energies elsewhere ; but the beauty of agriculture, well comprehended, soon makes them see the vast field of knowledge to be cultivated, and a place wherein they may give free scope to their thoughts and ideas. It must not be forgotten that the nature of the Canadian is expansive, that he likes conversation, to "orate" as we say. This natural desire will find its satisfaction in the club, and in a profitable manner.

Success is the offspring of profound conviction. Conviction, like faith, can remove mountains, and difficulties are not wanting on the road to prosperity. Agricultural clubs, it must be confessed, are of a very delicate constitution ; when once a club has been properly established, I have observed it needs :

1. That the entrance be free, that everybody be admitted and well received. The club should not be for a few, but for all ; proper behaviour should be the only requisite for the members. I have seen a club perish from inanition because 50 or 25 cents were required from each member wishing to belong to it ; or, again, because notice was given that only those who had paid the entrance-fee would be admitted ! Therefore, my opinion is, that it should be free ! When the thing is understood and appreciated, people will willingly submit to the payment of whatever trifling expenses there may be. Or, again, although a proper style of behaviour must be displayed by the members, it is often the part of wisdom to correct faults by persuasion and by showing interest in the faulty one. Example is a grand leader ! Once more, let every one come, see, speak and be listened to there !

2. Let it be the farmers who speak, discuss, talk about those things that co ncern them. And not the first comer, who would sermonize them

with but a bad grace ; for, indeed, *chacun son métier*, as we say, and farmers are very tender on this point: a single word may spoil the whole thing. Let every one be thoroughly persuaded that the object of attending the club is to bring together the experience of all, each one contributing his share for the general good.

3. The secretary should be deeply impressed with the great importance the most trivial ideas expressed may have ; he must impartially respect every opinion, good or defective, and know how to turn to good account all that is said. Lastly, he must be very careful not to affront any one, but, on the contrary, he should be everything to everybody, and never lose sight of the general good : how devoted a man must he be !

4. An interrogator, not a fault-finder ; it is better to try and make people speak than to contradict them opportunely or the reverse. Farmers are like other mortals, they stick to their own ideas ; we must know how to deal with their susceptibilities ; a man will often accept a sound opinion when expressed, but he will take good care not to let us see that it is new to him. Study, apropos, to divert the discussion if it threaten to become personal.

5. An umpire of the deliberations should be a man not connected with the club, but who possesses its confidence ; extremely prudent, while speaking the whole truth ; for in this more than delicacy is involved ; there is responsibility : a great expenditure may be the consequence of the decisions of such an arbitrator.

I must here make my compliments to Mr. Ed. Barnard, who has indeed been the first cause of the vitality of the clubs I have belonged to for several years. He has always managed to reply to all the questions asked with perfect success, to assign to each the proper merit of his statements : I have never heard of any farmer who has been dissatisfied with Mr. Barnard's decisions. The thing was more delicate in that the decisions were published in the *Journal d' Agriculture* ; and I will say, moreover, that every one is invariably in a hurry to see what the *Journal* has to say in addition to the report of the club-meetings.

6. The publication of the deliberations at each session is then very important, even indispensable. An intelligent farmer esteems it a great advantage to be able to put all sorts of questions and to receive an entirely gratuitous answer in *his* journal.

7. As often as possible, select a subject for discussion at the next session ; those subjects that present themselves naturally are always the best : hurry no man's cattle.

8. A direct grant from the council of agriculture would be of great use ; to pay the secretary, settle any little debts, particularly at the first starting

of a club, to help the parochial exhibitions, &c. For, indeed, I do not at all know who has accustomed the people to undertake nothing, even of the most profitable kind, without casting a glance aside at the public chest, at the Government, let us say at once. I fancy this greatly paralyzes individual energy. People have no confidence in themselves, and they muse upon nothing but assistance, place and pay ; there are no private undertakings : as if the Government could provide for all the world !

9. No politics in the club, not a word, nor talk about private matters; and no introduction either of general matters ; questions of general interest can be discussed at the regional meeting of the clubs ; but not in the parish clubs : no, never.

10. Practical lecturers will be required from time to time.

Here, gentlemen, are, I believe, the principal conditions necessary for the prosperity of a club, and the way to benefit all its members by its establishment. You will pardon me, I am sure, if I have not treated the subject in a more learned manner: I have consulted no books on the matter; I always prefer giving my own ideas to borrowing here and there what every one can read as well as myself.

Now, I should be glad to hear any one's remarks on what I have just said. If I do not mistake, gentlemen, agricultural clubs will, sooner or later, be the basis of the operations of the agricultural societies ; the dairymen's association will ever be the meeting place of all the distinguished men of the great agricultural family, and its reports will continue to be a complete compendium of the different operations of agriculture in the province of Quebec.

Ste-Rose ; Dec., 1889. O. E. DALAIRE.

DISCUSSION.

Mr. Barnard.—Here, Messrs cheese-and butter-makers, is a lesson for you. Here is a poor schoolmaster, a plain schoolmaster, who has not the the slightest interest in developing agriculture, and who, nevertheless, has, in his address, undertaken the task of bringing farmers together. He does not pretend to teach them. He says: "Gentlemen, I have no skill in your business, but I live among you ; you help me to a livelihood ; it seems to me that I owe you something, and I get you together to discuss this article that the Government publishes in its journal. All the questions you choose to put to me I will send to the director of that journal, and I ask you nothing for my services."

If you, cheese and butter-makers, would get those who furnish you with milk to unite together to form agricultural clubs, all the province would

profit by it. Mr. Dalaire has helped to establish five or six butter-factories in his parish. Almost too many for a single parish.

His address was admirable. He spoke of Mr. Barnard: do not place any confidence in that man; I know him well, and I have no confidence in him at all. (laughter).

But, get the farmers together; read them the reports of this meeting. Say to them: "Gentlemen; we passed two days at Arthabaska, and it was asserted there that eight or ten cows had given as much as 75,000 lbs. of milk in one year." Get them to discuss this statement, so that they may do what Mr. Bourque has been doing for so many years: applying to his best ability those lessons that seem good in his eyes, until, at last, he comes to this conclusion: "I am only a practical man, but I believe in keeping cattle in the sheds throughout the year."

Well! gentlemen, in this way of feeding, your factories will have so much milk that you will be obliged to build more. Make the farmers talk, note their objections, take the report that Mr. Taché sends you yearly, and say to them: «Mr. Bourque, who is a practical man says so and so; Mr. Chapais, who farms below Quebec, says so and so; Mr. Damien Leclerc, a farmer as well as a cheese-maker, so and so; Mr. Lord, who understands the business, so and so.» Make an effort. The way to be at the head of a club is to put yourself at the bottom.

Mr. Dalaire deserves many thanks, and I trust that this lecture of his on the simplest way of establishing clubs will bear fruit, and that in another year we shall see the number of clubs in active work doubled. The Commissioner is willing to pay $5.00 to any lecturer: it is sufficient if he be invited to lecture by some one in authority and that he proves the delivery of the lecture. But this has nothing to do with the extra quantity of milk you are going to have.

If you will allow me, Mr. President, I will refer to one excellent observation that fell from Mr. Laurier. He told us that we should not find him interesting, but he gave us a hint that, if profited by, will be of incalculable value to farmers.

Mr. Laurier told us that in every part of Ontario there are *Farmers' Institutes*, which are nothing else than district agricultural clubs, for all farmers of the surrounding districts are invited to join them. These institutes are managed by the most competent men of Ontario; they are held on certain appointed days. They are well managed....not as well, perhaps, as at Arthabaska, for here things are done in a princely manner; and if we were to return here too often, we should grow fat, but I fear we should not do much work. However, we do not expect to be treated everywhere as we have been at Arthabaska. What Mr. Laurier said must not be allowed to

fall dead. The *institute*, or district agricultural club, is the association *par excellence* to bring together men like you, gentlemen.

Mr. Laurier spoke to you about horse-breeding: a most important subject. Lastly, I hope the Commissioner, who will not compromise himself, will end by giving us what we ask for. I know that he is Christian enough to remember what the Gospel says: "Ask, and you shall receive."

Mr. Laurier.—It is with the Government as it is *above*.

SHADE AND THE FERTILITY OF THE SOIL.

By Mr. Norbert Bourque.

Mr. President and Gentlemen,

The flattering invitation given me by Mr. Secretary to come and address this association has placed me, you may be sure, in a very embarassing position.

Should I accept or decline the honour? Were I to decline it, I should be accused of ill feeling.

Still, I feel my incompetence to treat this subject, especially before an audience so well informed and so capable of determining the questions here discussed. I warn you, in all sincerity, parts are changed, and I feel much more at my ease in listening than in undertaking to teach.

One thought struck me: the soldier who loves his country ought not to choose in what way he will serve her. His duty is to obey, and he must go whithersoever his superiors direct him.

I am a member of your association,—the chiefs have spoken, my duty is to obey,—I am snre your good will, your indulgence is won for me, and that you will excuse the want of ability, which, in spite of my desire to be acceptable to you, I am conscious will injure my efforts.

I attack, then, my subject, which is divided into two heads:

1. Shade is favourable to the fertility of the soil;

2. The way to shade the soil without injuring the plants.

This theory is new, and may, perhaps, surprise you; and yet, for a very good reason, I do not mean to talk theoretical agriculture....I intend to treat this question practically, basing my statements on the experience of several years.

Every farmer must have observed that, under a heap of stones, a pile of boards or rails, under a cord of wood, or other matters that have covered

the land during a summer, that part of the soil that has been covered or shaded, is seen, when cultivated, to be considerably improved.

That land has lost its tenacity, it has become tender and friable; in digging, quantities of worms are seen; therefore, the sole fact of having been shaded has enriched it.

And is it not allowed by all that, in soils newly cleared which have for ages been shaded by forest trees, the soil retains for many years a marvellous fertility? To what is this fertility due? No doubt, in great part to the decomposition of leaves and other matters falling from the trees, but in great part, too, to the shade which it received before being cleared.

Is it not also admitted by all that such plants as pease, buckwheat, red-clover, &c., do not exhaust the land? Why do not these *draw* the land as much as wheat, rye, and oats? Because the last named plants do not cover, do not shade the land during the great heat of summer; evaporation proceeds easily, the ardent rays of the sun dry up the soil, the scanty leaves and stalks not being able to protect it.

With pease, buckwheat, and clover, it is very different. All the plants have thick layers of leaves which cover and shade the land, while allowing it to absorb the requisite amount of heat; and more: they preserve in it that amount of moisture that is as necessary to it as heat.

I understand the objection that will be readily made to my statement; it will be said that the leaves, &c., of these plants form a manure, and that it is this manure that renders the land fertile. I admit that this contributes to the enrichment of the soil, but I maintain that the shade has a much larger share in the fertilizing of the land than all these fallen matters (*déchets*).

Here is the proof: No one will maintain that, in the case of a heap of stones, a pile of boards or rails, or of a cord of wood, it is the fallen leaves, the roots, &c., that manure and enrich the soil. And yet, the soil that has been covered with these things, during only one summer-season, will be considerably improved. In this case, then, it must be to the shade alone that this improvement is due.

Now that I have shown you, as far as lay in my power, that shade is favourable to the fertility of the soil, you doubtless are anxious for me to point out the means of shading the soil without injury to the plants. You are perfectly right, for he who aims at an object desires to find the means of attaining it.

The means that I am going to describe to you are easy, for I aim at shading the soil by means of the plant itself. I aim at shading the land

particularly with clover, because it is a plant that grows very rapidly, and covers the ground afresh a very few days after it is mown.

In order to do this, clover-seed must be sown everywhere, not only for the purpose of making meadows, but on land that it is proposed to plough up again in autumn.

When I say « sow clover, » I do not mean a pound or two to the acre, but several pounds.

If it is intended to *seed it down,* timothy seed must be added to the clover, and the hay should be cut very early. It is only on this last condition that clover will grow again a few days after mowing. If the clover is cut early, in fifteen days the land will be covered again with it.

Second condition : never allow the cattle to run loose over the land in fall : « *l'abandon d'automne,* » as farmers generally call it.

However fine the grass may be in the fall, let it go to waste, as it may seem. But, in truth, I may tell you, this will be of great use to the land. It will keep the soil covered with shade against the burning rays of the sun, from the time it is cut to the dull days of autumn ; and, moreover, this grass will fall to the ground, and its waste will act as a manure for the succeeding crop.

With such conditions fulfilled, I can tell you, from experience, that a meadow may be preserved in a very good state of productiveness for several years without exhaustion.

I foresee that objections will be raised against the plans I have laid before you. I shall be told that this would be to change the custom of our farmers, which has been and is to allow the cattle to roam freely over the entire farm during autumn, and that it would be wiser to let them profit by this fine grass, rather than to let it go to waste, and see the milch-cows starve to death in our old pastures. I have foreseen the objection, and I will reply to it :

It will be admitted, I presume, that it would be highly advantageous to future crops if the meadows were not eaten down to the very roots and trampled by the feet of the cattle.

This being admitted, what should be done ?

Now, would it not be better to devote a small piece of land to green-fodder crops, to be given, morning and evening, to the milch cows, from the beginning of July, the time at which the grass begins to fail, up to the time in which they go into winter quarters ?

Half the piece should be sown, in early spring, with pease, oats, and barley, because these grains do not mind the spring frosts, and, consequently would be fit for the cows first of all. The other half should be sown to maize,

early in June, and would be fit to cut green as soon as the former part was finished. By these means, the stock would never suffer from hunger; on the contrary, they would have plenty of food, and would do no injury to the meadows. The profit the meadows would derive from this system would in great part pay for the labour employed in the cultivation of this piece in green-fodder.

Now, in order to complete the ideas which I have just communicated to you, allow me to add that it would be wise to let the stock pass their time in the sheds during the whole time they are being kept on green-fodder. In that case, a very large quantity of dung may be held in reserve, to the great benefit of the farm.

Lastly, Mr. President, I beg you to believe that I have put in practice all that I have just described to you, and that my experience of the system has been satisfactory. At the same time, pray accept my thanks for your kind attention.

East-Sherbrooke. NORBERT BOURQUE.

DISCUSSION.

M. LIPPENS.—I do not intend to examine from the scientific point of view the value of the idea that shade produces fertility, but there are, without doubt, some practical suggestions in M. Bourque's lecture. He is a thoroughly practical man, and the proof is that he has made his fortune by farming.

During the latter part of the season, the pastures are sometimes poor, and sometimes fail altogether. In that case, if the farmer has sown a certain acreage in maize, for green-fodder, with its assistance he can the better save his meadows. But I am not so absolute as M. Bourque, and I should not fear to to put a few cattle into the meadows.

I do not think we can lay down an absolute rule, and say: No cattle must set foot in the meadows. That depends upon circumstances. The real truth is: when the season is far advanced, then none must be allowed in; but the rule must not be applied in all its rigour.

There is a great deal said about ensilage. I have enquired of several farmers, and their opinion is as follows: we began by learning how to grow economically a small piece of maize, and we found that we had more than we could use in the summer, so that we were obliged to make a silo, and thence is derived the origin of the greater number of siloes.

I could give their names. I saw a curé who had cultivated maize. That

year he had too much. Well! He wrote in a hurry to Mr. Barnard to get instructions how to build a silo. Without this, he could not have built one.

Let every farmer, as a beginning, grow half-an-acre of maize, sown at various periods in succession; and after beginning in this way, he will soon work his way on to the silo.

I say, then, and I think I am right, that the cultivation of maize is a step on the road to the silo.

Now, as to the question of shade, raised by M. Bourque, allow me to say a word. M. Bourque is a good farmer: his plants come up well and cover the ground. I believe that the shade is rather the consequence of the good cultivation, than the cause of the fertility of the soil.

MR. BARNARD.—I do not blame M. Bourque for his rule that no beast should be put into a timothy-meadow, my experience being, that if you want to preserve such a meadow, you ought never to allow any cattle to enter it. Put them in the pastures if you will, but I prefer not even having them there. But as to the meadows, let them be at rest. Dung them, if you have any dung left; this will increase the yield. But a beast has five mouths: each hoof is a mouth, i. e. it takes as much out of a meadow as the mouth does.

M. Lippens spoke of necessity; I shall speak of foresight, among good farmers. With foresight, necessity can be avoided. Sow clover; cut it two or three times, and give it to your stock. M. Bourque, with his clover and maize, is never obliged to put his animals in his meadows. He is therefore right not to let his cattle run the meadows.

M. BOURQUE.—M. Lippens seems to deny the benefit of shade. But he must have observed that under a cord of wood that has lain only one season in a place, the soil has become so rich that it can be cultivated the following year without other manure. I do not intend shading the soil by means of a shed, but with the plants themselves.

In my lecture, I recommended sowing of other green-meat besides maize, Maize cannot be sown early; it does not grow quickly enough. It is sown at the beginning of June, and at the beginning of July the grass already has begun to fail, and the cows to suffer.

This can be remedied by sowing barley, pease, or oats, on half the land devoted to green-meat. No need of waiting till these plants are ripe.

It is in this way that I have been able to avoid pasturing any of my cattle in the meadows during autumn.

Accidental circumstances have obliged me to confine my cattle to the stalls. One season, they took such a liking to the green-meat, that they would touch nothing else. I was obliged to put my cattle in the stalls at

the beginning of August, and they were kept there till the following spring, to the end of May. I found that keeping them in constantly was a perfectly successful plan and I had a *very* profitable summer's work of it. It was by accident that my eyes were opened: you can profit by my experience.

THE SILO AND ENSILAGE.

By M. L'Abbé Chartier.

Contrary to my usual practice, and although I greatly prefer *speaking*, I shall be obliged, in order to allow more time for the other lecturers, simply to *read* the notes I have made on the different proceedings to be adopted by those who desire to make silage with as much perfection as possible. I suppose that a good deal of explanation will be needed, and, if the president will allow me, I will undertake to reply to all the questions I am able to answer.

To begin with, I ask you to be patient; what I am about to read is a discursive sort of essay. I was asked to speak on the progress ensilage has made; now, to treat that question fully, and to lay before you what has been done in it and what is being done to-day, would lead me into too long an address. The subject could not be exhausted in less than an hour or an hour-and-a-half; but I am restricted to thirty minutes. I am about, then, to read you these disconnected notes; they are only some observations I have made.

Four years ago, we began to make ensilage at the Seminary of St. Hyacinthe; I have attended to the business as closely as possible; all the improvements that I thought ought to be made, I have made; and I think we have succeeded tolerably well under, pretty nearly, all sorts of circumstances.

I do not by any means assert that we have arrived at perfection. There are probably in this numerous assembly many people capable of giving you information more learned and probably more exact than that I am about to relate to you, which is absolutely nothing but the result of my own experience.

To talk about ensilage, we must understand three points: 1. The cultivation of the plant to be ensiled; 2. the construction of the silo; and 3. the manner in which it should be filled. I will proceed after the manner of this formula.

As to the plant to be ensiled, I think we are all agreed that it should be Indian corn, or maize. I do not think there is any other crop that we can grow in the province which will yield as great a bulk as maize will.

Now, how ought maize to be grown? In answer to this question, I will try to say as little as possible, because I think most of you know more about it than I do.

Still, there are certain conditions essential to success, and when one does not succeed it is a dead loss: nothing pays better than maize when it is a good crop, and nothing makes such poor silage when it fails. How shall we proceed so as to insure success? We must have a soil well prepared, sufficiently rich, that is as rich as possible. The advantage of this crop is that you cannot over-manure for it. If there is a superfluity, the maize will take up an immense quantity, and the remainder will do no harm; a great many other plants do not do well when they have too much manure.

And so, you need not fear enriching your soil too much when you are going to sow maize. The piece must be well drained. Maize, when young especially, is very susceptible to moisture. If the piece has not been well drained, the seed often perishes in the ground, and, even if it come up, the crop may take a bad turn and never attain its proper bulk.

The land must be thoroughly worked, as perfectly pulverized as possible. To succeed in the cultivation of corn, every chance must be given it in its young state. If the land is badly prepared, if it be full of clods, then, you delay greatly the growth of the plant, and you run the risk of having many grains that never come up, or that having come up, die; and thus you will leave many a gap in your field.

As corn is sown late, you will do well to give one or two stirrings to the land before sowing, so as not to let the soil harden in the sun; drag it with a grubber, or harrow it thoroughly, in order to prevent it from getting baked, which, if it happens to do, it will be very difficult to get it fine again.

As to the way of sowing corn, I believe some people sow it broadcast but with us, who make ensilage, I think there is no broadcast work practised, because we do not care to fail in our undertaking. We therefore sow in rows; until we get more light, I think 20 or 24 inches between the rows is enough.

One thing I wish to draw your attention to: up to the present time, I think, we have sown too thick.

From the time we began growing corn, we have every year lessened the quantity of seed, and we find the quality improved, and, perhaps, the quantity increased a little. At first we sowed a bushel and a-half to the *arpent*; now only three-quarters of a bushel.

Well, I have almost made up my mind to sow only half a bushel next year; I think that will be enough, and that we shall get as much, if not more, than with three-quarters, or with a bushel, and certainly more than with a bushel and a-half.

As soon as it is sown, roll the corn, to firm the land, and give a chance to every seed to be pressed by the soil, so that it may begin to take root at once.

Do not wait too long for the first harrowing. If you wish to get your corn properly worked before the weeds give you any trouble, hoe, harrow, grub the land before the weeds appear. When once they show themselves, it is always difficult to destroy them. But, if you stir the land before the weeds are visible, when they have only just germinated, then, you kill part of the germs, and by that alone you destroy a considerable proportion of the weeds that would otherwise have grown.

It sometimes happens that the harrowing cannot be done soon enough, and from the moment that it is done *after* the weeds have sprung up all over the piece, it is always a more difficult job to destroy them.

Next, with regard to hoeing, I propose to draw your attention to a fact which you have probably noticed, but about which you cannot study too much. You are aware that maize forms a multitude of radicles, little roots, which spread on all sides; these give it its great power of growth; its nutriment is imbibed through this multitude of ducts. Well! I advise you to pay particular attention, after your corn is up, to horse-hoe, etc., very shallow. If you hoe deep, you will destroy a great number of these rootlets, you will injure the plants, and you incur the risk of your corn not coming to perfection. I have no doubt you know this very well, but it will do no harm to repeat it.

As soon as the plant begins to grow, it must be *lightly* cultivated, so as to do as little injury as possible to the rootlets which feed the plant and give it its strength.

I need not speak of the way to sow corn, I presume every one has his own way, and will hold fast by it. They are all about equally good, but, as some may care to know how we sow ours, here is the description:

We simply make a furrow with the plough two or three inches deep, and scatter the corn in the row, and, last year, we covered it, too, with the plough. We found that it was buried at a much more uniform depth. When we used to cover it with the rake, there were always a good many seeds left above ground, while by passing the plough along at about the same depth as in making the furrow, the corn was well covered, and, after a rolling, came up uniformly.

Take great care in selecting your seed to have it sound and full of health. There is a way, which is very easily practised, to judge of the quality of seed. You have simply to take, indiscriminately, fifty grains from the bulk of corn, and sow them in a box of damp earth. At the end of a few days the plants will be up. You then count the percentage of plants to seed,

and, then, you must reflect that in the open field you will not have as many grains come up as in the box, since the corn is under more favourable conditions in the box than in the field. By making this trial, we know precisely the value of the seed-corn, and do not hazard the loss of our best piece of land. For it is the best piece of land that is kept for silage-corn, and when this is sown, the season is over for sowing anything else except buckwheat.

When I speak of sowing half-a-bushel of corn to the *arpent*, you must not misunderstand me. Of course, if you are about to sow a corner of your piece in maize for your cows in summer, when the grass has become hard and the cows will no longer eat it, you should sow thicker. For, if you sow corn for that purpose, when the cows are in the pastures, and sow it too thin, the stalk will become too coarse and the cows will not eat it, or will leave the greater part. That is why a piece is sown thick ; the stalks remain thin and tender, and the cows will eat it up to the end of the autumn.

I do not doubt but that in well fitted land, well manured and drained, with $\frac{1}{2}$ a bushel of seed to the *arpent*, the weather being propitious, we may reckon on a yield of 20 tons to the arpent.

But when I say 20 tons to the arpent, it must be understood what corn I am speaking of. It is very sure that if you sow Canadian corn you will never get such a crop as that, and, if you sow Southern white-corn, you may harvest a great deal more. But until science has said its last word on the relative values of the different species, I can only advise you to sow the horse-tooth kind, or Western corn. With this, you may grow your 20 tons to the arpent, and if you sow it thinner, you will have a crop of ears to enrich your forage, and with which your cattle will be highly pleased. I think, until we know from the positive decrees of science that other kinds of corn are preferable, we had better keep to this sort. Our climate is not unfavourable to the Western corn. I know that we cannot reckon on its ripening its grain, but that is not what we want. Later, we shall see at what period of its growth the maize should be cut and ensiled.

I have very few remarks to make on the construction of the silo. All those who have entered on this business know how to build one, and those who are beginning to grow corn for silage, and consequently have to build a silo, will find in almost every locality plenty of information on the subject. I will only make a few observations.

The whole secret of success with ensilage, consists in putting the silage into an air-proof building. You may make it in any way you prefer, if this rule, which is peremptory, be faithfully observed. Whether it be constructed of wood, brick or stone is no longer a question. Experience proves that wood is as good as either, if not better.

The most important part of the silo is the bottom. The best material for those who do not care to make it of cement is beaten clay, raised to about half the thickness of the sleepers. This clay, beaten carefully, will guard against any influx of air from beneath, for this would be fatal to the silage. It is the air that enters from below that has the most disastrous effect. This is why I cannot advise any one to make the bottom of the silo of wood, because vermin will, from time to time, without your suspecting it, make their way through the boards ; thence follows an escape of gas, a current of air takes its place, and a quantity of the silage is spoiled, without your being able to help it.

Of course, those who do not mind the expense (which is not very great) of a cement-bottom, are still more secure. Still, with a bottom of beaten clay, there is no great danger of vermin getting in ; especially if the building be earthed-up outside to half the thickness of the sleepers.

The sides and the gables may be made secure by panelling them with two ranks of dove-tailed boards, one rank within and the other without. But, for greater security against the entrance of air, I recommend putting two ranks of dove-tailed boards *inside* with felt-paper between the two ranks.

As I have already said, I do not consider this necessary, but it is a still greater security. It sometimes happens, that with a single rank outside, and the same inside, air will enter without your knowledge, while, when you have two ranks inside, with felt-paper between them, you are safe from all danger.

If you want to exclude frost, fill in the space between the outside and the inside panelling with sawdust or tan-back.

As to the size of the silo, that is a matter of practice, which all who concern themselves with the matter understand. You are aware that, as a rule, the average weight of silage is 40 pounds to the cubic foot ; sometimes, more, rarely less. But, by taking an average of forty pounds, you are not likely to be deceived, and consequently the dimensions will be easy to calculate. Forty pounds to the cubic foot is equal to fifty cubic feet to the ton. Now supposing you intend giving ten pounds of silage to each of your cows at each meal, three tons each during the winter, you have only to allow, in building, 150 cubic feet to each cow, and you will have room for 30lbs. a head till spring arrives. If you want to give them more, build accordingly.

It is better to build less in breadth and in length, and to add to the height. The higher your silo is, the better will be the packing (*foulage*). If your herd is large, build on a large scale and divide the silo into two or even three compartments ; you will find the benefit of it. The interior divisions should also be air-tight ; though this is not absolutely necessary ; but to secure impermeability to the interior divisions, it will be enough to make

than of two ranks of boards with felt-paper between them. I say that this is not absolutely necessary, because where one of your compartments, shall have been emptied, the other will have fermented. Still, if your division is not air-tight, the silage will lose some of its quality by the entrance of air, which, though it will not utterly ruin it, because the fermentation is already complete, will make it flat (*éventé*) and diminish its value. Air-tight divisions are not expensive to make, and I think they had better be made so.

It remains to speak of the silage so called.

At what season must we begin to fill the silo? As much as possible, we should begin to fill soon enough to finish before the first frosts.

Frost is seriously detrimental to maize. It destroys almost completely the nutritive value of the leaves, and very much diminishes the value of the stalk.

On the other hand, according to the opinion of men of great experience, corn is in its richest state for silage, when the grain has passed the milk-state, and is beginning to harden. Judging from this opinion, which I have every reason to think well founded, it is of great importance to sow corn as soon as the soil is warm enough, and the danger of spring-frosts, in all probability, passed away. Sown at this period, one may hope that the maize will have arrived at the desired degree of maturity at the end of August or the beginning of September.

I will here give you the reason why I advise a diminution in the quantity of seed, and why I shall probably before long advise an increase in the distance between the rows. The nutritive value of silage depends greatly on the quantity of ears mixed up in it. Now, in thin-sown corn, more and larger ears are formed. At the same time, the quantity of forage is not lessened, because the stems, having more room, grow larger and longer, and compensate largely by their weight for the diminution of their number.

Cutting the corn $\frac{3}{8}$ to $\frac{1}{2}$ an inch with the chaff-cutter seems to me the right proportion. I believe that I have proved that reaping the corn in the field half-a-day at least before chaffing it, is a good plan. These few hours of exposure to the sun and air make it lose its first freshness, and seems to prepare it to make *sweet* silage.

It was this very last season that, following faithfully the principles that obtain elsewhere, even in the most advanced districts of the United-States, I succeeded in making silage that might be called *sweet*, although it was thoroughly fermented. This year, I had the corn cut and left in bundles in the field for at least half-a-day before carrying it to the cutter, and I attribute the absence of acidity and the other good qualities of our silage this year to this little operation. I believe the maize lost its first freshness, its moisture too perhaps, which is always excessive, and by this mode of pro-

ceeding we succeeded in making sweet silage. *Sweet* silage does not mean silage that has no acidity ; that would make it insipid for the cows. They would eat it, perhaps, but they would not like it as well as if it had a little piquant flavour. Silage, in general, has had too much acidity. And on this account, I lay some stress on the apparently trivial plan of leaving the reaped corn on the field for some time before it is taken to the cutter, because I believe it to be a point of great importance. Indeed, I cannot account for our not having been able before this year to make silage perfectly fermented and yet sweet.

I saw to-day some sweet silage, but it had not fermented. It was among the samples exhibited.

In some places, as you know, chaff-cutters are used with an elevator attached which carries the corn into the siloes as fast as it is cut. It is a great economizer of labour, and does not require any great additional power to work it. It is very certain that those who can arrange so that their chaffed corn shall be thus carried into the silo, without being touched by the men, will save a good deal by it.

I believe that the general practice to-day is to fill the silo only at intervals, and to allow each layer to heat up to at least 100° F., which requires generally 48 hours, before adding the next layer.

But, lately, I have seen the theory promulgated that it is not needful to fill the silo at intervals. This thesis is sustained by a professor in one of the agricultural colleges in the States. Until he has given irrefutable proofs that he is right in his conclusions, I would rather preserve the custom we have of only filling at intervals ; for the first trials we made of filling the silo at once did not give us full satisfaction. There was certainly more acidity in it than there is in ours of to-day, when we practise the method of leaving intervals while we are filling. That is why I advise those who have a large silo to divide it into three, if possible, so as to be able to work at it every day, and to finish as soon as they can ; for at that season of the year there is great danger of frost. If you can by any means fill the whole silo from above, I advise you to do so, that the door may be closed even before the filling is begun.

I have always found the door the most difficult part to close hermetically. Since we have filled entirely from the top, we have had no loss at the door-way.

Before beginning to fill in new layers, always look carefully at the corners and sides, and fill up the crevices which may have been formed there by the settling (*foulage*) that will have already begun.

When the silo is full, let it heat up to 130°F., or even to 140°F., then

put on the cover, which may be of rough planks, and put a layer of 7 or 8 inches of earth on the planks, so as to thoroughly exclude the air.

No pressure is wanted : this question is now completely settled.

Any other kind of cover, so long as it is air-tight, will answer as well as a layer of earth.

I will now repeat what I said at Three-Rivers : the silage need not even be covered. As to those who want to use it at once, they will sustain no loss. Only, you must understand, that, at first, the silage will have about the same flavour to your cattle as the maize as it stood in the field ; but there will be none spoiled.

Those who are not obliged to use the silage at once can also leave it uncovered, but, in that case, they must put up with the loss of the upper layer, 11 or 12 inches deep. There will be, at the top, a layer of that thickness of carbonized silage. But when that layer is removed the rest will be as perfectly sound as if it had been covered.

Thus, each will have to decide whether it is better worth his while to lose a layer such as I have described, or to take the trouble to put on a row of boards and cover them with earth, or any other material that is air-tight.

Now, we must not forget to watch this layer of earth during the settling, because the silage does not always settle equally. If it do not, then crevices are formed, and if care be not taken the air will get in through them, and you will have places on the top of your silage which will be a little damaged.

When the settling has finished, there is no need of further care : the silage can wait till it is required for use.

I forgot to mention one thing in its proper place ; when filling the silo, there is no need to tramp it. It is enough to spread the chaffed corn as fast as it arrives, so as to leave no vacua ; the settling will be brought about by the fermentation and the weight of the stuff itself. I do not mean to prohibit tramping ; it will not injure the silage, though it may retard the fermentation ; you will arrest the fermentation, which has it use, particularly if you tramp forcibly.

I cannot tell you how long you should wait before opening the silo, but certainly three or four weeks will be enough.

I recommend you always to take the silage from the top. It may be taken from other parts, but that is the way to preserve the same quality of silage throughout the whole mass. You can see that if you cut it out in slices, that will always make a partition wall (*cloison*) of silage which will be exposed to the air for weeks or for a time depending upon the rapidity with which you consume it. If you use it slowly, the silage will become a little flat (*éventé*) ; while, if you take it from the top, you will take two, three, or

four inches a day, according to your requirements, and it will be always fresh, while exposure to the air injures it.

I think I have touched upon the principal points in such a manner as to give you an idea of the progress we have made through practice and experience. There is still a good deal to be done before we can be certain that we are travelling in the right road.

Practice will secure to us the one part that we have not at present; the other part, the scientific, we can only obtain by means of the experiment-station. As to the way of making ensilage, that is a practical affair which we can learn; but with regard to the value of different kind of silage, sweet or acid, silage of green-corn, or silage of nearly ripe corn, no practice can decide their relative merits: that must be settled by chemical, analytical tests, and by experiments specially made on certain specimens.

Take three or four cows and give them different quantities each, but in accordance with the analyses which furnish the value of the different nutritive matters. It may be that experience will contradict the principle; that it may be true in theory, but false in practice. By taking in this way three or four subjects for experimenting, acting upon them with different qualities and stating the results obtained, we hope to arrive at the answers to many questions.

What consoles me is that we have now come to this point: we can trust to data so certain that there is no danger of suffering a dead loss and little risk of suffering any loss at all.

The first silo of modern times was built in 1874. No doubt, in ancient times, there were siloes, but in our day, it was in 1874 that Goffard made his first silo, and since that date we have gone on from discovery to discovery, and have placed the silo within reach of every one.

Goffard's invention was of hardly any use to the average farmer; it was supposed that buildings of stone or brick, cemented within or without, were necessary.

It was we, Canadians, who said: Since the only thing necessary is to exclude the air, wood is better than stone or brick. We were the first to make wood-siloes. It is in this way that we have gone on and made as rapid progress as we could expect.

In future I do not believe that our progress will be so rapid, for we are now at a juncture where science must come to our aid. Still, we have the experiment-station at our command, and I hope that, thanks to it, we shall be able to get on without too much delay.

J. B. CHARTIER, PRIEST

ENSILAGE.

Remarks by Mr. Louis Beaubien.

Mr. President,

When the Secretary asked me to give a lecture on ensilage, I thought I had already spoken often enough on the subject, particularly before the members of this association ; so I felt that I ought to refuse his invitation. I have not, therefore, prepared any address, and therein I have acted wisely, for what we have just been listening to has certainly been most interesting. And what chiefly delights me is, that this useful information comes from one of the distinguished members of the clergy.

I feel that we should applaud the line of conduct followed by those gentlemen who, reared for the service of the altar, destined to instruct the people, do not think it beneath them to put their hand to the plough and to set us a good example in agricultural practice.

For, in truth, we have a good example before us. You must feel that he who has just spoken thoroughly understands his subject.

The higher education we owe to the clergy. If we had not such as they to bring out our advocates, judges, all our leading men, we should never probably have gained the high position we occupy as a province or state. And if, as seems to be the case, the clergy are now going to devote themselves actively to the forwarding of the interests of the farmer, and these latter are to become as skilful as our politicians and professional men, our development will be complete all round.

Progress has been defined as a simultaneous advance in both the material and the intellectual orders. The latter we already possess. Our educational establishments have taken the man of low class and converted him into a leader of the people : if they take the farmers in hand and make them as skilful practitioners as the gentleman we have just heard, I dare to predict that our furrows will give us golden harvests.

We must applaud what our clergy, the bishops at their head, have done this year. I flatter no one, I only state facts. I see by the papers that the Cardinal and several bishops have advised their priests, in the meetings of the clergy, to recommend the use of ensilage to their flocks ; Monseigneur Gravel calling their attention to the fact that it was the best way to make their parishioners prosperous. Thus, we see that the agriculture of the country occupies the attention of the clergy. We see, too, that one of our colleagues, without leaving the ranks of the clergy, places himself resolutely in our ranks. He has not been satisfied with making speeches ; he has gone to work in the fields, and there he has experimented, and after his experiments.....he got the first prize for his sample of silage, but I'll prove

to you directly that it is I who ought to have had it (*Laughter*). Well! after his trials, he comes here and tells us frankly: this is my experience: I have shown you the road that I have opened, follow it.

I said that there is a great era of prosperity opening for us, I have received many letters on this subject, probably because I have already had occasion to express myself publicly on the matter. And who were my correspondents? Almost all of them members of the clergy. I could read you several of these letters, which are really worthy of publication; saying, for example: "I beg you, my dear Sir, to help me to success in this pursuit; for, if I fail, the good cause will be ruined."

I still remember well the words of this curé at the head of his parishioners, who are not quite leaders in the cause of agricultural progress: "I have striven to find some farmer or other who would take the lead and build a silo. I regret to say I have not succeeded! Thus, as an example, I set to work to build one myself." He was not a farmer; he has no land; he went to a farmer's place and built a silo at his own cost: this year there are twelve siloes in that parish!

This will show you that Mr. Chartier is not the only example-giver; there are several who imitate him fortunately, whereat we ought to rejoice.

How many siloes are there in the province of Quebec? I have not counted them, but, judging from my correspondence, I am inclined to think there are two thousand. There are siloes in every parish where agricultural clubs exist, and parishes that had no silo two years ago now have from ten to fifteen.

It is an important question, this of the silo. Our difficulty, as you know, is how to carry on our stock through the winter? With a silo, the farmer can always keep his cattle well during the dead season.

Now, a word with my friend, Mr. Chartier. Let us ask him for an account of the decisions he has just given on the different samples of silage, one of which is from my farm.

How many samples of sweet ensilage were there, and were all the samples shown sweet silage?

M. CHARTIER.—Don't ask me, please? Ask the committee? I refrained from acting as a judge, because I myself was an exhibitor.

MR. L. T. BRODEUR.—There were eight samples under examination; we found that four or five of them were sweet silage. M. Beaubien's did not err on that side; it was very sweet; even too sweet.

M. BEAUBIEN.—Just so: that's exactly my own character. (*Laughter*).

M. BRODEUR.—In order to free M. Beaubien from his embarrassment, I will state that, we three or four judges found his silage-sample to be a little

stale : it may, possibly, have deteriorated on the road hither ; the box was partly open. But I am certain the silage, when in the silo, was good.

I dare say M. Beaubien does not like being beaten by his pupils: Beaten last year, and again this year : it is pretty hard on him ! (*Laughter*).

M. Beaubien.—I cannot let myself be thrown behind in this way. I should have been the first, but, as you have heard, the box was open. I have always enemies, and one of them, it is clear, must have opened the box to injure the sample.

M. Chartier has told us that a wooden cover should be put on the silage, and earth on the top of the wood. I have a silo that has never been covered. I wished to try the experiment, and it has succeeded perfectly.

After the top of the silage had been salted a little, I began to feed it out, the cattle being then in the stalls.

I have three siloes ; the other two were covered. I always thought that the silo ought to remain closed for a month. Nothing of the sort. The covering cannot be replaced if the consumption is to be begun immediately after the silo is filled. The silage had begun to get sour at the top. I salted it again. At the expense of a sack of salt, we got through the layer of silage that was spoiling ; the cattle never refused it ; the milk never had a bad taste, and it is that silage that ought to have had the first prize to-day, and which only got the fifth. because it was uncovered. I have got rid of the cover for you ; you ought to have given me the first prize. (Laughter.)

Now, there is another improvement that I have to tell you about. I have not tied up the corn in sheaves this year. I began to sheaf it, but I found it was a waste of time ; the maize was so big, so long, averaging twelve feet, that the bundles were too heavy. In opposition to M. Chartier, I do not advise you to sow in rows at 20 to 24 inches apart, but at 3 feet apart : and half a bushel of seed is ample.

The silo is the savings bank of the farmer. You can ensile a quantity of stuff that would otherwise be lost, the whole chaffed and ensiled at the same time as the maize. I have used for this purpose the tops of carrots, parsnips, mangels ; and Jerusalem artichoke stems, green oats, clover, rye, can be thus treated. Sometimes, buckwheat is frozen ; ensile it and you will find the use of it in winter.

This year, I sowed at 3 feet apart, with a drill that sowed artificial manure at the same time. Sow 4 inches deep, and distribute on each arpent at last 200 lbs. of phosphate and 200 lbs. of plaster, mixed,

This drill, that costs $25.00, covers in the seed as well. Nothing remains but to roll it.

The operations, condensed, are these : Plough in the fall ; in spring,

pass the 3-horse grubber over the piece, then the common harrows, roll and sow. There are no raised drills, the land is quite flat. Then, set your feering-poles in a row, draw out the first line, driving the horses over the poles, and the marker will trace out the next row for the drill to follow.

Begin to hoe at once. You must not wait even until the weeds show themselves, you know how these weeds originate. If you stir the land you will find little filaments ready to push out. And it is at this time that the smoothing harrow will be found unequalled. It will destroy all these sprouting weeds without disturbing the germinating corn. You can make this harrow yourself: take a round bar of steel, half-an-inch in diameter, and having made it into teeth, drive them slantingly into the "bulls" instead of placing them straight as in common harrows. Harrow the land before the corn has come through, and continue doing so from time to time, across as well as along, until the maize is six inches high.

My foreman was frightened out of his wits at seeing me tormenting in this way a crop that had so well *brairded*. Here and there, there was a plant or two pulled up; but when the field was in full growth, there were no miss-plants, and very little hand-hoeing was needed.

When the corn is so high that the harrow can no longer be used, it is the turn of the horse-hoe to work; after that the earthing comes up. And this is a point my friend forgot to touch upon. It is of the greatest importance, to prevent the corn from being laid. Earth-up with the double mould-board plough, opening the mould-boards as wide as possible. If you sow thus at 3 feet, the corn will be so strong that it is useless to tie it; you would only lose your time. You can handle it 5 or 7 stalks at a time. A man, working all day, cannot handle more at once.

The riper the corn, the sweeter will your silage be. The plant will contain more sugar. We must therefore sow at a distance that will allow the corn to attain a certain degree of ripeness.

When to cut? When the ear is formed, and without waiting for hard frosts.

What sort of corn do you sow? I differ from M. Chartier. I have sown several sorts of corn: Canadian corn, small sweet-corn, horse-tooth, Western; corn from Mr. McPherson, of Lancaster, which is called *Mammoth-Southern*, that is, the great sweet-corn of the South. It is rather dearer than the rest. Mr. Evans charged me 80 cents for the horse-tooth kind, and Mr. McPherson sold me his at $1.25. The latter was 3 feet higher than the other.

I prefer the Mammoth-Southern. Analysis may give us contrary results. I do not know of any corn, which grows higher, or yields more nourishment. It is called *sweet*, and I know that the cattle devour it voraciously.

Experience then induces me to advise you to sow this sort of corn.

We are asked when the silo should be opened. My experience affords you an answer : open it when you please ; since mine has never been covered.

I find that at the spot where the silage falls into the silo, it is much more tightly packed than elsewhere. This spot will be hard and will not sink equally with the rest, which makes the silo-surface resemble a cone. To avoid this, tramp every part when filling, and leave the part on which the elevator delivers the chopped corn the lowest.

The system of ensilage leads naturally to the continuous stabling of cattle. For those who have a hundred acre of pastures to give their stock, that may be the most economical system, though I have my doubts on the subject. Perpetual stalling is the condensation of farming (*culture condensée*), and the one that must be the most profitable.

This is what happened to me : we sowed a piece of land, which was in corn this year, with red-clover. Our siloes will last till the clover is fit to cut ; the clover till we can cut green corn, and this will last till the siloes are ready again.

Here is the way in which I was led up to continuous stall-feeding. I have but little land where my stock are—about 25 arpents. All the rest is in bush, a fine lot of wood that I wish to preserve. I intend to let my cows roam this bush, and put part of the pasture into maize, sown thick, so that both leaf and stem may be consumed.

I am certain that, with this plan, I shall be able to keep twice the stock I had last year.

I am asked : how much manure do you use, and of what kind ? We are close to the town, and therefore do not economize manure, as we get it easily. We put at least 50 loads to the acre ; the soil, too. is very rich.

M. Chartier, who has seen my crop, laid it at 35 tons to the arpent. I know that in the fall, I, on one of my Percherons, disappeared in the standing corn, which was higher than my head.

Besides dung, I sowed, when putting in the corn, 300 lbs. of plaster and 200 lbs. of phosphate bought of Mr. Brodie.

My directions for silage-making are in print. A copy of the work is at your service.

We here insert a report of the judges of ensilage-samples exhibited, read by M. Chapais :

REPORT OF THE COMMITTEE ON ENSILAGE.

ARTHABASKAVILLE, DECEMBER 10TH, 1889.

SAMPLES	CLASSIFICATION BY THE JUDGES.
Seminary of St. Hyacinthe	1
M. Louis Lemire, Baie du Febvre	2
Col. the Hon. W. Rhodes, Sillery	3
Déaf-Mutes, Mile-End	4
M. Louis Beaubien, Outremont	5
Fulgence Préfontaine, South Durham	6
M. Carrier, St. Agapit	7
Agricultural School, l'Assomption	8

Note.—M. Fréchette, of St. Agapit, exhibited a sample of clover-silage which was judged as *good*, but not classified with the corn-silage.

Members of the Committee { MESSRS. L. T. BRODEUR, N. BOURQUE, FRS. DION.

DISCUSSION.

M. LOUIS BEAUBIEN.—(Addressing M. Chapais). Is the report on silage you have just read the one for this year?

M. CHAPAIS.—Yes.

M. BEAUBIEN.—But I never opened my box of silage! Anyhow, nothing gives me more pleasure than to be beaten. The man who has a silo becomes crazy about it, and his greatest ambition is to see his neighbour do better than himself. That is just how I feel to-day. I thought I had the best silage, and I only got the fifth place. I heartily congratulate those who stand before me. I fancied my silage was the very best that could be made; now, if better than mine can be shown, I think it is an excellent thing. The silage was perfectly sweet, and I hope if I make any next year, God willing, I shall be placed fourth in the show. (*Laughter*).

M. NORBERT BOURQUE.—M. Beaubien is decidedly our master in silage-making. He it was who introduced it into the province of Quebec; if he is now beaten by his pupils, he ought to be proud of the education he has given them.

M. CHAPAIS.—I beg leave to tell the meeting that Messrs. Choquette and

Chartier were named on the commitee, and that they were necessarily excluded when we awarded the numbers; so that the decisions were perfectly impartial. Besides, it would have been equally so, I am sure, even had those gentlemen taken part in them.

REMARKS BY M. J. A. MARSAN.

At the risk of being compared with Balaam's ass, who answered without being questioned, I will make a few observations on ensilage. When I heard the report of the committee, I, too, felt a lively satisfaction—at being the last on the list. This proves to me that the report is quite just, and confirms me in the opinion I had formed before leaving home; for when I was putting the silage in the box, I said to myself: I am beaten!

Here, I think, are the causes of my defeat: 1. The corn was cut when too ripe: in October, about, and even after, the 15th. It is clear it could not make first rate silage.

2. It was cut too long; but the chaff-cutter would not cut it shorter.

3. The silo was filled at once, without any break, except on a Saturday and the Sunday following, on account of bad weather. There was still corn in the piece, another silo had to be built, and the corn I brought here came from that silo, that is, from the silo containing silage in the worst possible condition.

Anyhow, this proves that there is a set of rules that must be observed. These rules we have not observed, and our silage has been beaten. But M. Beaubien should not have a spite against me for having thus respected the paternal authority. (*Laughter*).

As to the building, I followed the teaching of M. Chartier, except that the bottom is of wood. But we shall have time enough before next harvest to make it of clay.

Next year, we shall cut our maize at a better season, and I hope that those who beat us at the next competition will have had considerable progress to make.

M. VIGNEAU.—I propose that the association print a certain number of M. Beaubien's pamphlet on ensilage to enable us, the makers of cheese and butter, to distribute them among the patrons.

THE MILCH-COW.

BY MR. ED. A. BARNARD.

Mr. President and Gentlemen,

Unfortunately for me, with the best intentions possible, I can never overtake my work. You know that I am director of the Journals of Agriculture. Now, in order to direct them properly, I had requested permission to devote myself entirely to them. For several years, this permission was granted. During the day I worked on my farm ; I devoted the evenings to my publications ; and the night was far advanced before I slept. For I think that, if a journal is to be useful, it must be as near an approach to truth as human truth can be.

Unfortunately, gentlemen, I have been called away to other work, more arduous because more extensive, and I find myself on the eve of the day on which I am expected to speak, without having had time to think of my address. Thanks be to God, I began, twenty years ago, the study of what I am about to speak of about here. My first remark will be on the progress we have made during the last twenty years.

I spoke this morning about the little confidence which was felt twenty years ago in the dairy-industry as being likely to be successful in the province of Quebec. The answer to this, gentlemen, is your presence here, Mr. President, butter-maker that you are, and a good one, too. You, too, Mr. Commissioner, who have interested yourself for fifty years in the future of agricultural industry. And you, gentlemen, who come from all parts of the country to listen to the exposition of the truth as far as it can be attained.

An immense progress, then, has been made by our association. We are satisfied that, by the dairy-industry, the province of Quebec will gain the very topmost rank in agriculture, and will compare advantageously with any country in the world.

The lectures we have heard to-day and yesterday give us reason to hope that, in a few years, light will come to us from the North, as heat comes to us from the South.

We have the means in this province of carrying on the dairy-business to perfection. We have the means of making excellent butter. Let us then make it of the best quality : competition is very powerful in the market.

Whole car-loads of butter pass here. Do you know whence they come ? From Denmark. Do you know whither they are going ? They are crossing the continent on their road to Japan and China. Why ? Because the Danes have for fifty years cleared the road and preceded us therein.

Let us, gentlemen, be as shrewd as the Danes; and although we are fifty years behind them, let us try to pass them.

For this, it will not suffice that our butter be good; it must be of the very best quality. It is to attain this end that our association is striving so strenuously.

But, to have butter or cheese, we must have milk. Thus, the first development necessary is that of the milch cow.

And this is the subject I propose to treat; the milch-cow. There is one thing about which I do not think I deceive myself. Do not think me too vain, but there is this one thing that I think I know better than any one else; in fact, I think I am thoroughly acquainted with it; it is, that what I have still to learn is a great deal more than what I already know. I consider myself, then, to be an ignoramus. Still, thirty-three years ago I was much more ignorant than I am to-day. Unfortunately, I was not lucky enough to receive the higher education. Thirty-three years ago, then, I knew nothing. I was not accustomed to live on a farm, and yet I had to live on one, because I had to pay the rent.

At that time I consulted all the best authorities, my neighbours. The Scotch told me that, as milch-cows, there were none better than the Ayrshires. I began with a small herd of Ayrshires, and, when they failed me, I had to fall back on the Canadians. My mother, being herself a Canadian, preferred Canadian cows; my father, being an Englishman, had more confidence in English cows, the Ayrshires. But he did not know more about it than I did. I inclined towards his opinion because the Ayrshires were by far the finer beasts. But at the end of ten years I found that the rent was chiefly paid by the Canadians.

At the end of thirteen years, I was placed, against my will, in an official position, the direction of the Journal d'Agriculture. I was unfortunate enough to express what I held to be the truth, and I lost all prestige with the Council of Agriculture. They told me there was no such thing as a Canadian cow: they might just as well have told me I was not alive. I saw nothing around me but Canadians.

Then, they asserted that these cows were good for nothing: look at this table.

The twelve numbers represent twelve cows, whose dams I bred. I began with Canadian cows; but, to prove that they were good for something, aided by Prof. Brown, of Guelph, I bought there, at a cost of several hundred dollars, the best shorthorns, as I had previously bought the best Ayrshires in the province of Quebec; and some Devons, from the Queen's herd. In short, I put foreign cattle in competition with Canadians. They were fed for milk-production, and I proved that, after having laid out hundreds of

dollars as the cost of management (*frais d'administration*), I had lost my money, and that the Canadian cow was the best of all.

Allow me, now we are on this subject, to quote to you from the writings of Jules Crevat, who has been *crowned* by his fellow-members of the Société d'Agriculture (*France*), the most distinguished men in Europe.

Jules Crevat is a farmer, the son of a farmer. About twenty years ago, his father, after having taught him all that he knew, found himself unable to instruct him in the higher branches of science; so Crevat went and took his degrees in the first educational establishments in France. Afterwards, he went to Germany, with a view to study more deeply the scientific questions connected with the feeding of farm-stock. He went through his course in Germany, and, having possessed himself of all the scientific culture of that country, he returned home, and, during twenty years of the application of his scientific acquirements, here are the results of his labours:

'The best milch-cows are not only remarkable for the enormous quantity of milk they give daily through the first months of coming into season, but *especially for their long continuance in keeping up the flow of milk.* A *superior cow* never dries up completely; a *good* milker yields milk up to a month before calving; *average* ones dry up three or four months previously; and *inferior* cows only give milk for five or six months.

Very superior cows have been known to give 80 lbs. to 99 lbs., and even 110 lbs. of milk a day, requiring to be milked four and five times daily; but, generally, three times is enough, and, towards the end of the milking period, twice will be sufficient.

In determining the qualities of a milch-cow, the richness of the milk must be taken into account. This is far from being constant in all breeds, or under all systems of feeding. It varies even in the proportion of two to one (*du simple au double*), particularly as regards richness in butter. It is usually reckoned that, on the average, it takes 25 lbs. of milk to make 1 lb. of butter; but this quantity may rise to even 38 lbs. and 40 lbs., or fall to from 20 lbs. to 18 lbs., as the average in the year.

There is an easy way, and a fair one for cows of average weight, of determining the quality of a milch cow: compare the weight of milk given with the weight of the cow. Thus, when the total weight of milk yielded in a year, with ordinary food given *ad libitum*, shall prove to be:

10	times	the	weight	of the cow,	she is a *superior* one
8	"	"	"	"	very good
6	"	"	"	"	good
5	"	"	"	"	middling
4	"	"	"	"	indifferent
3	"	"	"	"	inferior
2	"	"	"	"	very inferior.

Small cows give much more milk, relatively to their weight, than large ones, and they eat more in proportion."

As I said this morning, there is milk and milk. There is rich milk, and milk much less rich. There are cows that yield rich milk on condition of being fed on rich food. I cannot enter in full to-day into the question of feeding for milk-production, but the Journal d'Agriculture—which all the members of this association may have for thirty cents, though it costs the Government, that publishes it, a dollar,—the Journal, I say, is about to treat this question of feeding specially. This information, pointed out to us by Crevat, I have been studying to prove correct for the last five or six years.

Here, gentlemen, is the proof of it :

Registered numbers.	DATE						AGE		Pounds of milk a day per cow in		Live weight of each cow.	Proportion of Jersey blood.	Yield of the whole herd.		
	Birth.			Last calf.									Month.	Number of cows milked.	Total monthly yield.
	Days.	Mths.	Years.	Days.	Mths	Years.	Years	Mths.	May 1889.	Nov. 1889					
16	16	3	1887	9	4	1889	2	8	22	13	594	7/8	1888 Dec..	3½	1567
19	22	3	1885	22	12	1888	3	1	38	....	713	3/4	1889 Jan..	4	2493
15	15	1	1886	16	1	1889	3	..	41	14	815	3/4	February .	4	3258
17	4	5	1885	31	3	1889	3	10	37	19	598	3/4	March....	6½	4696
21	27	3	1885	15	3	1889	4	..	41	17	623	3/4	April.....	11	7964
13	27	3	1885	11	3	1889	4	..	36	22	713	3/4	May.....	12	8686
18	2	4	1884	20	4	1889	5	..	45	18	722	3/4	June.....	12	8752
14	2	6	1883	3	2	1889	6	..	41	18	645	1/2	July.....	12	8819
22	2	5	1883	10	3	1889	6	..	40	21	693	1/2	August...	11	8645
12	12	5	1882	15	3	1889	7	..	42	....	776	1/2	September	11	8338
11	6	6	1882	14	7	1888	7	..	22	18	887	1/2	October...	11	7145
				24	6	1888					688		November	10	5425
10			1879	9	10	1889	10	..	18	29	8467				
											705				75,788lbs

These cows, as you see, by the table, have given a prodigious quantity of milk. The young ones have given from 7,000 lbs. to 8,000 lbs. of milk a year.

But, you will say, how do you know that they have yielded 7,000 lbs. or 8,000 lbs. ? Thus ; from the official returns made to the Commissioner of Agriculture.

They are sent in by a religious community that has the use of these cows for nothing, on the condition of weighing the yield of each milking.

A nun milks the cows ; after each is done, she weighs the milk, and, deducting the weight of the pail, notes down the weight of the milk. This she does thrice a day, for the cows are milked that number of times.

The Sisters have found that, as certain authors have shown, if the cows are not milked thrice, 25o/o is lost : that is 18o/o in quantity, and the rest in richness.

How are these cows fed, then ?

During last winter, they had 8 lbs. of hay, on the average, 3 lbs. of straw, and 15 lbs. of silage. This is the ration of the cows belonging to the convent which were dried off. There are forty-six, altogether, but I have only taken those that we have been experimenting with for several years.

The cows that are giving milk have in addition 1 lb. of cotton-seed cake, and a quarter of a pound of bran a day. This allowance is tripled for those that give 30 lbs. of milk a day, &c.

You see in the table 41 lbs. and 45 lbs. All these cows have yielded up to 45 lbs. in the day. They are fed in proportion to the milk they give.

If the hay is clover, which is much better than timothy, it will cost the farmer about ¼ cent a pound. Clover, if ensiled, keeps perfectly. And here, I will mention that though there is much said about corn-silage, no one has told you that clover-silage is worth twice as much. Now, all your farms will grow clover, but, unfortunately, you do not know what to do with it.

Besides clover, we give 3 lbs. of straw. Why? Because we have no more. Our cows are kept in the city of Quebec, so the straw has to come a long way, and hay is relatively cheaper.

The silage we make at home.

Cotton-seed meal, delivered at Quebec, costs nearly $24 the ton of 2,000 lbs. The cotton-seed is crushed, the oil extracted, and the cake is the residue. This forms a food that every farmer who has good cows should buy ; for he can sell his oats at double the price the cotton-seed cake would cost him.

When I recommended this cake to the Sisters, they were told : « Don't « buy that stuff ; it will burst your cows. »

It is clear that if you eat three or four pounds of almonds, or nuts, after dinner, you will have an attack of indigestion. This cake is nothing else but a nut, full of oil, and which must be given mixed with other things (*en la démêlant*). You know that cows that only get 8 lbs. of hay and 3 lbs. of straw with the little *moulée* I mentioned would not have enough under ordinary conditions

Here is a great question for discussion. If you give your cattle dry

hay in winter, you are giving them food they are not inclined to digest. You must go back to the natural order of things. Men, not nature, make hay. It is not, therefore, a food naturally adapted to the production of milk. This hay must be transformed into a succulent food.

The way to do this is simple. Any farmer can do it: take the hay, and put it into tubs; coal-oil barrels cut into two will serve; wash the tubs; burn out the inside; that is the best way of cleaning them; and when the oil is all gone, put the hay into them, a half-bundle in each tub, well pressed down, and sprinkle it with salt and water. Put on the cover, and leave it so. The next day you will find it has become a mucilaginous substance, which your cattle will eat greedily; it will have absorbed a quantity of water, and acquired a flavour from the salt that the cattle will like well, and set to work at once to yield milk in abundance.

Try it. A cow is kept to give milk: if she does not, what is the good of keeping her?

You have a cow you are about to dry off, because she is on the point of calving. Give her some hay, prepared as above, with a little bran, or the meal of pease and oats, in a mash, in proportion to the milk she gives, and you soon will be surprised to see how she will lose her old coat, and give an abundance of milk.

In a lecture delivered some years ago, I advised a certain curé to try this with a cow. He had only one. I returned to his place about a month afterwards. It was in January I went there; the cow was due to calve in April; he was going to dry off the cow immediately. Well! I was told that the cow had given six pounds of butter in the week!

That is what a system of feeding suited to the production of milk will do.

The table you see before you will be published, in the Journal d'Agriculture, with notes from my hand.

The herd in question is composed of Canadian-Jerseys. Why? You listened yesterday to an excellent lecture from Mr. Couture on the *breeds* and *races* of cattle. (1) He told you that in Wales there is a race of cattle resembling very much the Canadians.

So, in Ireland, the *Kerry cow* is, according to Mr. Couture, the sister of the Breton.

Likewise, the Breton is the sister, if the expression may be allowed, of the Jersey. The fact is, the Channel-Islands and England, according to the best authorities, were, ages ago, attached to the continent by a peninsula jutting out from Brittany. This is the explanation given by science; I don't know anything about it; but I know that these two cows resemble one another like two drops of water.

(1) A *race* of cattle is, or is taken to be, aboriginal: as the Devons, Kerries, Welsh, &c. A *breed* of cattle has been made by man, by selection, crossing, &c.: as the Shorthorns, Herefords, Ayrshires, &c. Trans.

I chose the Jerseys then to cross with my Canadians ; for my friends kept saying to me : " your cows are good, but will they breed you good heifers ?" I thought over the matter, and said to myself : " To secure a good heifer from a good cow, the bull she is served by must descend from a good milking strain."

To breed a good cow, the grand-dams, on both sides, must have been good cows. If you select a bull on account of his beauty, without enquiring whether or not his dam was well fitted to the pail, you run a great risk of breeding inferior cows.

Well ! I chose a bull from one of the best strains in the world, from the *Mary Ann of St. Lambert* family, which was bred in the province of Quebec. Frequently one sees it stated in English or German books, that Mary Ann of St. Lambert is a Jersey. People seem to think that she came from St. Lambert in the Island of Jersey. Not at all ! She came from St. Lambert, near Montreal.

I selected, then, her brother. A splendid bull he was, having cost $790 at three months old. He was bought in New-York, and had to be brought from Kentucky. It was not I that was guilty of such a bêtise, but I am glad it was done, for this has enriched the province of Quebec with animals superior to what were considered the finest herds in the world.

Choose, then, carefully on both sides of descent, and the yield and quality of the milk will be first-rate.

Here, Mr. President, I conclude. The deductions from what I have said must be reserved for the future. The best things must have an ending. There is the Journal d'Agriculture, of which I am in some degree both father and grandfather, and, if you have any confidence in my system of feeding, you have only to read it. All of you who have any questions to ask and cannot put them here on account of the shortness of our time, can address them, if in English, to Mr. Jenner Fust, if in French, to M. Chapais. These two gentlemen will reply to you at full length, and I will put in the periods and the commas.

But, before I finish, a word on a matter of nationality. Not about politics, be sure of that. I am unfortunate enough to be called, among the English a *bloody Frenchman* (*sic*), and the French-Canadians call me «un sacré Anglais» (*sic*) (*Laughter*). It is not my fault. Settle that with my father and my mother, who consummated this union. But, gentlemen, I was born in the province of Quebec, and I learnt to respect my mother, and I have found that it is not impossible for everything French-Canadian to be of the best quality. It was asserted that the Canadian cow was not a good one : I have endeavoured to prove the contrary. People have said Canadian corn

does not exist : here is some that has been grown by the same family for eighteen years.

Ah, gentlemen, don't go to the West for silage corn. Here is some that grows from nine to ten feet high, with such ears as you see before you.

When you have anything good in your own house, don't throw it away to replace it by a foreign production. Neither our Canadian corn, nor our Canadian cow can be surpassed. M. Choquette may be able to give us next year facts that will support my position.

The Americans imported some of our corn and grew it, expecting to get no crop. Well ! The Canadian corn grown at the Minnesota experiment-farm was so rich that it yielded double the nutritive matter of the American corn. Professor Goessman proved, about ten years ago, that the Eastern corn was worth twice as much as the Western.

I have finished, gentlemen. Thank you for your attention.

THE CANADIAN RACE OF CATTLE.

BY DR. COUTURE.

Many of you, doubtless, remember that at the St. Hyacinthe meeting of the Dairymen's Association, in 1883, I suggested, or rather repeated, the idea of renewing the Canadian race of cattle, and I proposed the establishment of a herd-book. In 1885, in another lecture, at Quebec, before another association, I again suggested the establishment of a register for Canadian cattle.

The Government felt that these suggestions were not devoid of good sense, and in the next session passed a law to establish a herd-book and a golden register for Canadian cattle.

The book was opened in 1886, December 6th, and at the Three-Rivers' meeting, the following year, we had seven entries.

During that year we enrolled 26 pure-bred Canadian males ; 6 Jersey-Canadian males ; 145 female Canadians, and 28 Jersey-Canadian females : in all, 205.

The next year, 1888, the entries were few. Why they were so, I will tell you presently.

In 1888 we inscribed : only two pure-bred Canadian bulls ; 13 Canadian females ; 8 Jersey-Canadian males, and 7 females. In all, 30 entries.

This year, 1889, in a special division of the herd-book, the entries have increased considerably. We have entered : 31 pure Canadian males; 24

Jerseys or Jersey-Canadians (since in accordance with a clause in the rules of the herd-book, Jerseys and Guernseys, deriving from the same stock as the pure Canadian cattle, have the right of entry). We have thus registered 24 male Jerseys or Jersey-Canadians and 2 Guernseys ; 74 female Canadians ; 33 female Jerseys and Jersey-Canadians and 1 Guernsey. In all 165.

There are thus at present on the roll 98 pure Canadian males ; 38 male Jerseys and Jersey-Canadians and two Guernseys ; in all, 138. Pure Canadian females, 232 ; Jersey-Canadians 60 ; Guernseys, 1. In all, 301. Total 438.

There are, besides, at least 50 requests for enrolment. I say at least ; I may have perhaps 100. I have not counted them, but I know I have a great many.

In 1887, the first year, we solicited entries from the proprietors rather than were asked to take entries by them. I had been sent to the county of Charlevoix specially charged to see if there really was a great number of Canadian cattle there, and to take entries. As I went along, I saw as many Canadians as I could wish to see. I took 100 entries, and upwards, of animals belonging to persons who appeared to be anxious to have their stock entered, but who, since then, have given us no notice of births, deaths, or change of ownership ; therefore, concluding that they were determined to be silent on the matter, we erased their names completely. For, if this herd-book of Canadian cattle is to continue to exist, we must be able to keep in view the movements of the inscribed beasts, what becomes of them, and of their progress, their yield in milk,&c., their value, &c. As soon as any one enters any cattle and ceases to communicate to the commission the informa tion it requires in order to let the public know all that concerns this race of cattle, there is no need to continue such entries, they had better be expunged. So that we solicit entries and we accept those that are offered, after inspection, and for the future, from now to the 16th November next, when the herd-book will be closed, we propose to expunge from the book those who shall not have given us information during the past 10 months. The herd-book will not be closed till 16th. December, 1890.

I said that it is necessary that the commission should be kept thoroughly informed about everything that happens as regards the animals entered. Thus, it is important that all transfers of stock be notified. The owner of an entered animal sells it ; it is important that the commission be informed of this, in order that the beast be entered in the name of the purchaser. It is still more important that the births be communicated to the commission, that it may be enabled to say to those seeking information :

« A certain cow has produced such and such an animal, which belongs to so and so. The dates of the births ; the greatest yields of milk and butter ; in fact, all possible information must be given. And so for the

deaths, particularly if the animal be sent to the butcher, that the entry may be expunged from the book and give us no more trouble.

Otherwise, the herd-book becomes a farce, absolutely nothing more than a farce.

It would be useful and advantageous to owners of entered stock to submit them to tests, so as to ascertain, as nearly as possible, their yield of milk or of butter. It is unnecessary to say that, if the proprietor of a herd is really anxious to make money, to make it pay, he must advertise it ; now he can have no better advertisement than by communicating the results of the above tests to the commission, which will, in turn, communicate to the press the good, the extraordinary yields of the inscribed cows. This is important in future, for enquiries come to me every day from persons desirous of buying Canadian cattle, who want to know where to find them. You understand, of course, gentlemen, that I send the enquiries to those persons who, I know, possess cattle of real value, animals having already given their proofs.

I must tell you that I have now more than one enquiry from breeders who desire to establish a herd of Canadian cows. I would give you their names, but perhaps it might give offence. Anyhow, I may give you two requests, one for ten, the other for fifteen cows.

It is also desirable, and even necessary, that the dairymen's association should lend its aid. The Commissioner of Agriculture is present : now is the time to ask him to give the association a grant of $500 to be specially devoted to this end. I do not think he will refuse the association such a sum as that. Let the association contribute a little ; let it get subscriptions, if necessary, and I feel sure that we can find six or seven hundred dollars to be offered in prizes at the next-competition.

Those who have regularly attended the association's meetings know that these competitions, when they have been held in a strict and orderly way, have been productive of much good.

It may not be useless to tell the members of the convention in what places the Canadian cattle are most easily found.

I have often repeated, I have mentioned in the newspapers, that they are to be found in every part of the province, or, if not every part, at least in a great proportion of the counties. There may be counties in which there are none, as in the Eastern-Townships ; but even there they are to be met with. I went to Shefford last autumn, and there I saw a fair number ; also, in the neighbourhood of Sherbrooke I saw several.

In Charlevoix they abound, for there is no other kind in that county. There, one may buy a cow with one's eyes shut and be sure that she is a

pure Canadian. So much so, that I brought with me, the other day, from the quarantine, a pupil of the veterinary school. He is the son of a farmer, and has a passion for agriculture himself. I took him, without giving a hint of what I was about to show him, to see Mr. Dawes' herd of Jerseys. He had never see a Jersey, only Canadians and, perhaps a few Ayrshires. Showing him the herd, I asked him : "Have you many of that style of cow at home?—" We have nothing else."—" Of that colour?" "Certainly of that colour."—" Do you find any difference between these cows and those you have at home?"—" Yes, they are not exactly alike ; the horns are a little shorter, and they (*the cows?* Trans.) are a little larger. Except in those points, there is absolutely the same shape, style and colour. They are our own cows exactly.

Another herd ; a herd of Kerries, little Irish cows. They are all black, and resemble our Canadians exactly, to whom they are, in, my opinion, very nearly related ; so nearly, that they must derive from the same stock.

We went up to a herd of these Kerries, and I said to my pupil : " Are there any cows like these at your place?" " Yes", he said ; "There are a few, but in the next parish there are plenty."—" With just the same appearance?"—"They are exactly like our black cows." He was right.

I repeat it : in the county of Charlevoix you may go with your eyes shut except in one place : Malbaie.

Of course, there are bad as well as good Canadians. On the average they are good, but, in buying them, you must be as cautious as you would be in buying any other stock.

I will add that, in the county of Charlevoix, the form of the cattle is very fine. It is, perhaps, the district in which the Canadian has most perfectly preserved its conformation. They are exactly like the Jerseys: in colour gray, or completely black.

Kamouraska is full of Canadian cattle. There are others: Ayrshires, even grade-Shorthorns ; but the great majority are Canadians. Their colour is not the same as that of the Charlevoix cows. They are, in colour, fawn or light red, with black points, or entirely fawn, or brindled, striped (*bringé*). Of those I have seen, the commonest colour is fawn with black points. The majority of the Kamouraska cattle are Canadians. A good point in favour of these is that they are large ; and this is to be accounted for by the richness of the pastures, and the superior food given to the cattle.

In the county of Lévis are many Canadians, but there the colour is not uniform. Those of Charlevoix show great uniformity of colour, they are always gray or black. In Lévis, on the contrary their colour is not uniform.

Uniformity of colour prevails too in the neighbourhood of Three-Rivers,

in the counties of Champlain and St. Maurice. There, we find very fine Canadian cattle : fawn-coloured with brown points. There are many in Maskinongé, Nicolet, and Soulanges. Last year, I examined cattle from Soulanges very much resembling the Kamouraska, except that they had coarser heads. Their form was the same. You can find as many Canadians there as you would wish to buy.

Now, how shall we distinguish a true Canadian cow ?

And, first, let us mention what points are to be avoided in the selection of these cattle. First, deep red in colour ; a cow of that colour cannot be a pure Canadian ; there is no such colour to be found among them. The true colours are : fawn, fawn with brown points or gray. A yellow ring round the muzzle, or a white ring if the cow is gray. In the case of brown cows, there is frequently a brown, or a fawn stripe along the back.

Every beast with the least sign of deep red must be rejected. This colour belongs to the Ayrshires, the Shorthorns, but, emphatically, not to the Canadians.

Striped or brindled cattle may be admitted. This kind of beast is, however, less handsome, and I approve of it less than of the others. All the brindled cows have longer, bigger, and, consequently, plainer heads, than the others ; their horns are uglier, longer, and turned up in front ; while the Charlevoix and Kamouraska cattle have shorter horns, turned upwards and inwards, which gives a neater appearance to the head.

Black and white. Pure Canadians are rarely found with this admixture of colours There may be some, but I have never seen any. I never saw black and white cattle with the same style of head and of the rump (*hind-quarters* ? Trans.) that pure Canadian cows ought to have.

Ash-colour. In my opinion, this colour ought to be avoided. There may be Canadians of this colour, but I never saw one. Anyhow, it is a favourite colour among the Shorthorns, and everything that bears the colour of these cattle must be avoided by those who do not thoroughly understand the characteristics of these two races.

A colour that is often met with among the Canadians is blue. Still, if I wase asked for my opinion, it would be : select cattle that are all black, or all fawn or fawn, with brown points, or gray.

I, like many others elsewhere, am under the impression that, before the expiration of ten years from the present time, we shall make nothing else in the province of Quebec but butter and cheese. For the North-West sends us more butcher's meat than we can consume, as it does of grain and heavy horses. There remain for us, in this province, the dairy industry, the breeding of little trotters, and, perhaps, of general-purpose horses. Seeing

that these things are so, we ought to do all in our power to improve our dairy herds.

To arrive at this end, we have several means at our disposal. The first is, to improve the stock we have in the greatest plenty, that is, the Canadian cattle which form 75o/o of the general stock of the province. It remains for us to improve, by a better mode of feeding, those which we still possess of this race of Canadian cattle, or to cross them with the Jersey, the Guernsey, the Ayrshire, or even with the Holstein (*Dutch?* Trans). But how many farmers are there in a parish able to buy every two or three years an Ayrshire bull? I believe there are very few who can afford the outlay, and still fewer who would care to make it. And with still greater reason is the number less of those who would go to the expense of buying and keeping pure-bred Jerseys that cost even more than the Ayrshires.

Still, it would be better to have recourse to this plan, in spite of its slowness, than to remain where we are.

If those who are obliged to keep a herd of milch-cows could only be brought to understand the value of uniformity in a herd, it would be a great step in advance. We must then improve our cows not only as regards their productiveness in butter and milk, but also as regards the uniformity of the herd. Uniformity in a herd adds 25°/o to its value. A buyer, who is about to start a herd, will always prefer buying two or three cows of the same colour if he finds them at the same farmer's, to running about from place to place to pick up animals of uniform type.

I firmly believe that in a few years all the foreign breeds which people have been trying to establish among us at such great expense, Ayrshires, Jerseys, &c., will be worth no more than ordinary prices, (*valeur vénale*). Only three or four years ago, all these sold for extravagant sums. You could not buy Jerseys for less than $300, $400, $500, and then you only got an animal that might be good, but was often not so. Ayrshires fetched less; but still a good deal more than they fetch to-day. The Dutch, the Shorthorns, were exorbitantly dear. A Dutch calf could not be bought for less than $250 to $300. Things have altered very much; the prices of these animals have greatly fallen, especially here and in Ontario, because it is understood there, as well as in the province of Quebec, that before the expiration of a few years from now, it will be necessary to replace the beef-breeds by dairy-cattle. The price of Shorthorns, Herefords, Angus, &c., has fallen then to the real value of these animals. The best of these can be had for from $50 to $100, whereas, three or four years ago, we should have to pay $300 or $400, for the same stock. I include the Jerseys; we now pay between $50 and $100 for what, a few years ago, we should have

had to pay $400, $500, $600, or $700. We must then bring things back to their natural condition.

Now, instead of trying to get rid of the remains we possess of the Canadian race of cattle by crossings with breeds of no more value than itself, we should do more good by seeking to improve our own stock, as regards its form and its yield of a milk, by a rational system of feeding. This important matter is beginning to be understood. Every day I receive letters asking me for information about our milch cows and expressing a desire to establish without delay a herd of them.

I observed that I thought the Kerry and the Canadian cows were sisters. You would be surprised to see how like our black Canadians are to the Kerries, which are excellent milkers. I forgot to say, at the beginning of my address, that black was one of the most desirable colours in a Canadian cow.

Perhaps, this may be my opinion because the best Canadians I have seen were black, small, low on the leg, and broad.

Here I am led to mention something that you doubtless know already, but which cannot be too frequently spoken of : the signs by which we may judge of the good or the bad milch-cow.

This is easy enough, provided we bear in mind a few simple rules. The first thing to be looked for in a milch-cow is a *feminine countenance.* A cow with a bull's head is never good for anything, because she has not the qualities fitting for her sex. So, also, a bull with a feminine head will not prove himself to be a good stock-getter. His face cannot be too *virile* ; the neck large, the wickedest eyes, forehead broad and thick with hair, the expression ferocious.

The physiognomy of the cow cannot be too feminine. The more gentle, calm, and refined the expression, the greater probability is there that the cow will be fitted for the producion of milk. Consequently her head ought to be perfectly lean. There should be nothing on it but skin and bone ; no meat, no fat. If there be any fat, her head will have more or less of the masculine look.

Her neck must be very fine ; for the characteristics of the females of all races is a refinement of expression in the physiognomy, a fineness in the neck, and in the anterior part of the body.

The greatest possible fineness in the shoulders, neck, and head ; from the shoulders, rearward, the proportions of the trunk should increase amply. A good bull should have a thick neck, ample shoulders, fore-arms, and brisket, and gradually diminish from that part, rearward ; just the reverse of the cow, which should have the anterior parts fine and the posterior

large. The larger the hinder parts are from the point of one *branche* (?) to the point of the other, the nearer the udder is to the ground, the fitter will the cow be for the production of milk. Physiology and zootechny will explain this.

If a cow be narrow behind, high on the leg, there will be no room for the vessels, less blood will circulate, and there will be less nutriment afforded to the organs we want to make use of.

Even if there be no other sign than the largeness of the milk-vein, that is a good mark of distinction. The more the hind quarter is developed, the larger will this vein be.

Consequently, that which we ought to seek in the cow is the greatest possible development of the hind quarters, in width and depth. There are small Canadian cows that have this point developed in an extreme degree. Among others, I know one or two cows, near Quebec; two little black cows, that have *these strongly developed*, very narrow before, very large behind, and their teats are not more than 8 or 9 inches from the ground.

Those who have studied Guenon's system a little may certainly derive benefit from it. It is not necessary to study all the varieties that he has pointed out. That is absolutely useless. But, if you would select a good cow, largely developed behind, that is, if the space between her legs be very wide, you will always find that she has a first-class escutcheon. Cows of this class are always of the type "*flandrine*". You will never see a *flandrine* that is not wide behind, and, similarly, you will never see a wide-quartered cow that is not a *flandrine*. The two things go together.

Here I finish my remarks, recommending to your attention a constant study of the improvement of Canadian cattle; that will make you happy and prosperous.

THE NATIONAL STUD.

Remarks by M. Louis Beaubien.

Mr. President and Gentlemen,

I have no wish to refuse the invitation I have received to address you on the subject of the *Haras National*, because I do not think I ought to neglect any opportunity of promoting that undertaking.

I have to say, in beginning my address, that had I not met in France persons acquainted with Canada, appreciating our people, and knowing thoroughly what horses would suit us, I should never have succeeded.

All that I undertook to do, for my part, was to dispose of the goods,

to make sales. The difficulty, in an enterprise of this kind, is the purchasing, and I take the liberty of presenting to you, absent though he be, our vice-president, M. le baron E. de Mandat-Grancey, whom our literary men know already by his witty writings, in which will be found more than one kind allusion addressed to the French-Canadians. He is assuredly the soul of our enterprise. The capital subscribed is half Canadian and half French. M. de Grancey is the proprietor of farms in la Perche. It is he who makes the purchases. Of his work I wish you to judge yourselves. I am not going to sing the praises of our horses, knowing as I do that the French-Canadian has an eye for a horse, knows how to judge of one. I submit myself to your judgment; all I ask of you is to examine them.

There are among them, I believe, horses to suit all tastes. Those who want heavy ones, can find them there from 1,850 to 1,900 lbs at 3 years old. Those who seek a horse fit to take their wives out for a drive, a horse endowed with much showiness and quickness of action, may look for him among the Normans; and those who prefer the old fashioned Canadian, will find their kind among the Bretons or the smaller Percherons.

I know not if there are any Scotchmen present; I should not like to annoy them, but we told M. de Grancey, that for our part we began to be tired of the Clydes, and wished to have a style of horse with more muscular power and greater activity: horses that, without losing the qualities of a draught horse, would be able, in cold weather, to bring us back from market at a trot. We asked for mettlesome horses, horses that could really replace our old Canadians.

You are aware that the old-style Canadian horse was very handy at his work. Unfortunately, he has completely disappeared, and the few specimens that we have been able, by begging and praying (*à force de réclame*), to bring together, do not by any means represent our old-fashioned style of horse. Well! The French have preserved the race of horses from which sprang our old Canadians.

You know that the Percherous, like the Normans, were taken under the care of the French Government itself, and that since the time of Louis XIV. Now it was under that king that the greater part of the French horses which laid the foundation of our breed of Canadians came to this country.

These horses were carefully preserved by the Government, in its own studs (*haras*—an Arabic term. Trans.), and it is for this we have taken the name *haras*: we wished to copy these establishments.

Not only does the French Government give prizes and certificates to the different stallions in the departments, in order that the farming population may know where to find a good one, but it also collects into haras a certain number of these horses. For example: the haras at Pin has at

least 400. As soon as a horse has served his time, he is drafted, and a fresh one takes his place. The Government has been doing this for 300 years. From these haras come the Normans we have purchased.

And now, examine them ; if you do not find them to your taste, we deserve no encouragement. But, if you find the horses worthy of being travelled in your counties, then you can make your bargain with us to greater advantage than with any others, for you will not have to incur the expenses of a journey to France ; and going to France is not all : you must know when you get there, where to find the right stamp of horse.

As for the hire of these horses, the price is necessarily pretty high ; but you must bear in mind, that we alone run all the risks ; wherefore we ask for the season one-third of the value of the horse.

Doubtless, we might find, in the country parts, people who have a taste for horses, and to whom they might be safely entrusted, but, as a general rule must be laid down, to avoid offending any one, we have decided to keep our horses continually under the care of our own men. Those who hire our stallions will have to meet the cost of the journeys both ways of man and horse, as well as the board of the horse as long as he remains in the country. On the whole, you will avoid the risks to be run in keeping a horse. There always is some risk, especially with these horses, for there is always a chance of their being attacked with a fit of apoplexy (*megrims ?* Trans.)

Up to the present, people have preferred purchasing to hiring, and perhaps it is the better system after all. Some have even preferred buying in the fall, in order to get the horse used to his new dwelling, and to introduce him to the neighbourhood.

I hope the province of Quebec will profit by the experiment of our partners. They are certainly good judges of horseflesh. These purchases have been founded, not upon what might perhaps be the fashion, but, upon what was really good and well-bred.

You are not ignorant of the fact that the Americans have strayed from the true paths. Thus, in the States, all they ask for is a horse weighing from 2,000lbs, to 2,200 lbs. Well ! any horse whatever of that weight is so heavy and dull, that you can get no great pace out of him. Everything must of necessity give place to weight. The Americans, I must say, are at this moment wandering in wrong roads.

In this country of ours, it is well understood, that to satisfy a farmer, we must give him a general purpose horse, and not one of which it can only be said : This is a big horse.

Make a horse of 2,000 lbs. trot for 15 minutes, and you will already have taken a good deal out of him.

M. de Grancey has written thus to me several times: «Your climate is very severe; the roads in autumn and winter are necessarily heavy; you have deep snow; the horse I recommend you is the Percheron of 1,500 lbs. to 1,700 lbs., the old Percheron of France; that is the style of horse you need."

If "Joly" is rather big, we have in him made an exception to the rule: he was so handsome and something was wanted to catch the fancy of the Americans.

REPORTS OF THE INSPECTORS.

THE MANUFACTURE OF BUTTER AND CHEESE.

To the Honorable the Commissioner of

Agriculture and Colonization,

Quebec.

Sir,

I have the honour to submit to you my report as inspector of creameries and cheese-factories, for the present year. I began my inspection June 11th and finished it September 27th.

During that time, I visited 94 factories, 54 of which were cheeseries, 31 creameries, and 9 combined.

In comparing my notes of this year with those of last year, I have to observe that there has been less progress made in the manufacture of cheese than of late years. Still, I must say that, in consequence of a certain number of factories not having been visited last season, they share largely in this diminution of progress, and, for the most part are at least a year behindhand in the improvement of the manufacture.

In the division travelled over, the cheese is everywhere made after the Cheddar system, but, in many factories, there is much to be done before a perfect Cheddar cheese can be made in them.

In some places improvements are made very slowly. There are factories very defective in construction, and which have gone on for several years without any attempt at improvement. It is not surprising to find in such factories more cheese of the second than of the first quality.

In many factories, the fitting up is still by no means perfect. The utensils employed are frequently very defective, and are not always in accordance with the present system of making cheese.

The curd-knives are susceptible of improvement. Some of them, the blades being too far apart, do not cut the curd fine enough. A good curd-knife should have its blades sharp and smooth, and not placed too far apart: three lines is a good distance. The knives, often made by the

nearest tinsmith, are good for nothing, and cause more loss in one season than the purchase of several good ones would amount to.

The syphon is a great deal too much in use. I have observed that, where it used, the quality of the cheese is inferior, it not having the proper degree of firmness. Drawing off the whey with the syphon prevents the maker unless he has two assistants, from stirring the dry curd for the time and under the conditions requisite to obtain a firm and well subdivided curd. If the advantages of a good tap over the syphon were known, or rather felt, nobody would hesitate about getting one.

There are still many faults in the method of manufacture, of which I will enumerate the principal and most common ones. The chief and most general fault is the want of sufficient stirring of the curd to firm it before being piled at the sides of the vat: this work is rarely well done. The curd ought to be well firmed by energetic stirring and kept as much as possible in small grains, as it was in the whey (*tels qu'etant dans le petit lait*). These two points are important, if we wish to make export cheese of the best quality.

Another defect consists in being in too great a hurry to grind the curd; instead of leaving it three hours in heaps ; it is only left an hour or an hour, and a half. Our present experience proves that about three hours must elapse between the drawing off of the whey and the grinding of the curd, for the latter to be in proper condition to make cheese of the best quality.

When the curd is full of eyes (*poreux*) a longer time is needed, to allow of the escape of the noxious gas contained by the curd. During all this time it is of the greatest importance that the curd be kept warm, up to 94° F. to 96° F. Moreover, thorough stirring after the grinding is important ; twelve minutes will do for sound milk, but porous curd requires much longer stirring to get rid of the numerous little eyes it contains before salting.

The creameries are still in about the same state, that is, improgressive. There are a few good ones, where butter is well made, and where there is a striving after improvement, but the great majority of the creameries are just as they were three or four years ago : they still keep on in the old routine. This state of things is due, as we know, first to the makers not understanding their business ; next, to the factories being badly fitted up. It is not more difficult to make good butter than to make bad, but to make it good, the very opposite conditions must exist which are present when bad butter is made ; that is, there must be a good situation, good fittings, lots of cold water as well as ice, and, above all, a maker who knows his business. These four indispensable conditions, particularly the last, are often absent in our creameries. The most general defect in the buildings is that the butter-storeroom is commonly too hot. The utensils are usually serviceable,

except as regards the preservation and ripening of the cream ; the pails employed for this purpose in most factories should be replaced by vats. The water supply is often defective ; either there is not enough of it, or it is too hot : a good supply of ice will cure this latter defect. As to ice, many creameries do not use it, and the supply, in the majority of instances, is insufficient. To invariable success in butter-making, ice is indispensable. There is no water cold enough to do without ice in hot weather. It is not sufficient to cool cream down to 60°F. before churning, as is generally done. It is of the greatest importance to cool the cream promptly, directly after skimming, or better, during skimming, to the lowest possible temperature, to 40 °F., or lower still if it can be done, to keep it at that temperature for several hours, to warm it up again to make it gain a slight degree of acidity, to churn it at a low temperature of 54 °F. to 56 °F., and to turn the churn rapidly, though not beyond reasonable limits. Cream treated thus will be easy to churn, will give a better yield, and will produce the best of butter ; provided always it be made after the granular system.

The manufacture of butter offers no encouragement for the future, as regards exportation, if we judge by the bad reputation our butter has acquired in England : this increases instead of diminishing. It is time that active measures be adopted to improve the manufacture.

Our system of packing is very faulty. A great deal of our butter is indubitably spoiled because the tubs are not air-tight. The defective preparation of the tubs shares part of the blame

What is wanting to enable us to improve is: schools where experiments shall be made on the best methods of manufacturing butter, and especially on the packing and shipment of it.

The hasty inspection we are obliged to make on account of the great number of factories we have to visit, is the reason why we cannot do more good. This rapid inspection answers much better with the cheeseries than with the creameries. It would be better to visit only one-half, even one-third, of the factories we now visit, and do the work well ; or more inspectors should be appointed. In most cases, the inspector should stay not less than two days in the same creamery, in order to work along with the maker, and to corrects any faults there may be in his method. It is true that there are some factories so badly fitted up that it is almost impossible to teach anything in them practically ; but the number of these is not large.

Another obstacle to progress is the almost uniform price at which butter, good and bad, is sold. I have frequently heard makers say : Why should I take so much pains, give myself so much trouble, in making my butter ? I sell mine at the highest market price, or as high as such-an one of my neighbours, who takes an infinity of pains, and does not get more than I do.

As to the price paid for butter, it is positively true that there is little difference paid between the various qualities, and this greatly contributes to the stoppage of progress. Thus, in the present state of things, if we desire to improve our methods of manufacture, and retain the English market for the sale of our butter, it is high time to set to work.

Let us hope that our association, aided by the Government, will take the steps necessary to promote this end, and that progress will arouse itself.

Respectfully submitted,

J. L. PAINCHAUD.

DISCUSSION.

Mr. BARNARD.— It would appear from this account of inspections, which is consequently an official report, that the province is not doing its duty, that the members of this association (since it is the members whom the inspectors visit). are not doing their duty as butter-makers. and the consequence is that the butter is not getting rid of its bad reputation in the English market, a reputation which we are so much interested in doing away with. Apporos of this bad name which our butter has in England, M. Damien Leclerc asked me yesterday to raise the question of the manufacture of butter outside the creameries. Well, Mr President, if our butter makers think fit to throw aside the elementary principles concerned in the manufacture of good butter, how can you expect the farmers to learn them, and do better than those who teach them ?

M. Painchaud has made a suggestion that this association repeats every year, and I hope that you, Mr. President, will carry it into effect. You know that things grow. After the stalk comes the flower ; we have arrived at that point ; I trust we shall soon have the fruit. I believe that the inspections were among the most useful works of the association ; but, as the state of things changes with the times, a more thorough inspection is, as M. Painchaud says, necessary. And if the present President can help us to this thing, this one thing, he will have deserved vastly well of his country.

Now, before we teach farmers to make better butter, let us begin by establishing model creameries ; let the makers do their duty, and let this proposed school-creamery—which I gladly see is being set up under the direction of the professors at l'Assomption—be opened in the spring as the school of the province. I am certain there will be ice-houses there large enough to admit of the butter being kept in good condition. At last,

we shall have the butter-school that the province has been asking for so long.

As soon as we shall have professors up to their work, the farmers will learn how to make better butter. The English dealers will learn that the butter of the province of Quebec is at least as good as the Danish, and can be exported just as well.

On your return home, Messrs. butter-makers, say to yourselves : « I had « no ice-house last season, but next year no one shall throw that charge in « my teeth. » Put great plenty of ice into it, and next year you will have less difficulty in making your butter. I am sure that the makers who turn out good butter will agree with what I say. There are around me, I know of a certainty, makers who know how to discriminate, by the sound of good hard cash, the value of a good method of making butter.

M. MARSAN.—After the allusion made by Mr. Barnard, I feel bound to open my month, in spite of the silence I meant to observe, preferring, as I do, to display my work when accomplished rather than to talk about it beforehand. As to the opening of a new creamery at l'Assomption, I have to say that it does not as yet presume to call itself a school-creamery ; but it is our to intention to convert it into such an institution—if we succeed in laying hold of a maker capable of making perfect butter—for the benefit of all the people who shall frequent it.

I am not absolute master of that institution ; I have no control of the finances, neither am I its proprietor. But I will do all in my power to convert this creamery into a butter-school for the benefit of all the pupils of the college, as well as of those who come there with a special object, the study of the manufacture of butter. We have there good things to start with. As director of this school I entrusted the fitting up of the creamery to him who is the soul of our association. I believe that M. Taché has done his best, and that we shall have a well arranged creamery, both as regards the utensils and all the other things.

We have built an ice-house that will probably give good results, but to judge of that we must see what it will do in the course of the summer. It is built after the *Baril* principle. Being 19 x 21 feet wide by 20 feet high, it will hold a large quantity of ice. Beneath it, is a cellar constantly cooled by a current of cold air from the ice : this is the best plan. In this way we shall be able to keep butter during the entire year in a temperature nearly as low as that of ice itself. Our ice will be of the purest quality, for the water of the river l'Assomption is generally very clear and limpid, especially in winter ; hence the ice is free from all impurities.

We shall be in a position to give a fairly thorough course teaching of to the young makers who choose to come to study with us.

Perhaps, everything will not be perfect. The Government may perhaps complete the undertaking by sending us professors capable of delivering lectures on scientific subjects. If this would be for the public advantage, I am sure the Government will not lag behind ; and, as for ourselves, we are ready to take a large share of the sacrifices to bring the institution to a successful issue.

M. TACHÉ.—Mr. Barnard alluded, passingly, to the reputation of our butter. As I was translating, for the French press as well as for our association, Mr Lynch's letters, I had occasion to detect an error which they, unintentionally, contained ; for it was by no means the intention of the author to convey this impression to the public. He himself expressed quite a different opinion. People said to me : "How is it that your association distributes the letters of Mr. Lynch, in which he states that our creamery-butter is good for nothing ?" My reply was this : "There is a great difference between creamery butter and farm-house butter, the latter of which has made our bad reputation in England ; you are under a false impression : Mr Lynch's letters do not convey the meaning you attribute to them." I had added in one or two places in the translations *farm-house butter*, though it was not so printed in the original.

Here is one of Mr. Lynch's letters which agrees with the interpretation I have just given. Mr. Lynch states that the year he visited England, dealers were *only buying creamery-butter ; but that a little butter had that year been injured by a defect arising from the bad quality of the tubs.*

You see, then, that Mr. Lynch did not mean to place creamery-butter on the same footing with the ordinary butter of commerce, the farm-house-butter.

Look at the quotations of our butter and you will see *Canadian butter* quoted at 50 to 56 shillings the 112 lbs. (not even the price of cheese at 12 cents). How can that apply to creamery butter which is worth 19 to 23 cents ?

I had occasion to write to certain Montreal dealers to find out in what way creamery-butter was quoted. They replied that it is quoted under a special head : creamery-butter ; and that it was not so very far behind Danish butter.

So that those who hope that the butter made in this province will soon occupy a position that will not too greatly disparage the place held by our cheese, can encourage us in pursuing the road we are following as regards the butter-factories.

I wish to say a word about certain makers who are members of our association. What Mr. Painchaud said had no reference to those gentlemen, and especially did not apply to those who have delivered addresses to-day.

M. Painchaud told me yesterday that these men were model butter-makers.

We are the leading province of the Dominion as regards the manufacture of creamery butter.

At the two principal exhibitions of Canada, Ottawa and Toronto, two years ago, the two first prizes were carried off by French-Canadians. He, who took the first prize at Toronto, took the second at Ottawa, and *vice-versâ*. Go and ask the opinions of the Montreal dealers : they will tell you that the creamery-butter of Quebec can contend successfully with the butter of any province in the Dominion.

The position occupied by the provinces as to butter and cheese is inverted. We come in the second place—after Ontario—in cheese, but in butter we take the first place.

M. BERNATCHEZ.—Allow me to mention a fact connected with our creamery-butter.

I sent, last year, to England some butter made early in August : five tubs of butter from our factory, which I sent at the end of September. The agent to whom I sent it wrote to me : " Your butter arrived here in very good order. The quality is excellent, and I hope you will continue sending it." The butter was sold half a cent higher than we could have got for it at Montreal.

Again, in August I sold June and July butter in Montreal, to the Messrs. Ayer. I asked them if it gave them satisfaction. They replied : " So much so, that we have sold that butter to be sent to Scotland."

Thus, you see, all the makers are not incapable of turning out good butter. There remains still something to be done ; but we must not cry down our Canadian butter too much. We must not let people believe the reports about our butter not being fit for exportation.

M. Taché exhibited to the meeting a sample of a butter-tub for exportation ; bottomed at each end (*foncée des deux bouts*).

Mr. BARNARD —I have listened to your remarks with great pleasure. When I said just now that we had a good deal of progress to make, it was with a view to instigate our makers to pursue the road to reform as quickly as possible. As Mr. Taché observed, the province of Quebec is taking the lead ; only, the less that is said about that the better for us. There are many of us who want urging ; and when we see reports, like Mr. Painchaud's, which point out serious faults of manufacture, well ! we must tell the delinquents : " You have no right to do as you are doing." It seems to me that next year Mr. Painchaud will not be able to make a report similar to that of this year, because there will be ice-houses in every place.

To the Honorable the Commissioner of

Agriculture and Colonization,

Quebec.

Sir,

I have the honour to report to you that, having been again appointed inspector of creameries and factories, for the season of 1889, I proceeded, in accordance with instructions from the Board of Directors of the Dairymen's Association of the province, to make my visits of inspection in the following order:

The first month was employed in convoking and holding district-meetings, to which makers from neighbouring parishes were invited, in order to impart to them, in a practical manner, our knowledge of cheese-making, and to give them the advantage of communicating to each other their views on the subject. The places chosen for giving these lectures in the part of the province I had under my supervision were the following: Ste-Croix, at M. F. X. Bertrand's; Gentilly, at M. Eusèbe Houlde's; Ste-Anne de la Pérade, at M. N. E. Clement's; St-Norbert d'Arthabaska, at M. Germain St-Pierre's; St-Joseph, Beauce, at M. Joseph Lambert's; Malbaie, at M. Jules Bradet's; Baie St-Paul, at M. Chas. Martel's; Chicoutimi, at M. Chas. Tremblay's; St. Jérome du Lac St-Jean, at Messrs. D. Jalbert & Co's.

The total number of makers present at these lectures was 60, including the managers and apprentices (16) employed in the different factories in which these meetings were held; so that 44 persons must have left home to be present at these reunions. This number is certainly not great compared with the number of those who are cheese-makers in the territory I travelled through, since I visited 97 cheeseries, employing 175 men; but we must bear in mind the difficulty a maker finds in absenting himself from his business during a whole day of the working period, unless, as they were advised, he make his cheese the evening before, or the same evening on which the meeting is held, and that would be an innovation, it being extremely difficult either to get the maker to change, even for once, his habits, or to persuade the patrons to take their milk to the factory at an unusual hour. Nevertheless, I have seen people start from a great distance and arrive at the appointed place, and that, when the roads were in a very bad state: and I will say, that it was not these men who most needed to be present for instruction; while, on the other hand, others, their near neighbours, thought fit to despise these lectures, under the pretext, as we like to believe, that they knew more about the matter than we did. Even if this were so, these gentlemen ought to have made it their duty to come and

share with us their experience, and allow us to gain the advantage of profiting by it, in order to enable us to benefit the greatest possible number. Besides, we must not forget that the best workman may, even frequently, gain some useful hints in the very worst of workshops: and of this I had more than one proof in my visits, which showed me that some bad makers had a very intelligent way of conducting certain parts of their work.

The rest of the season was employed in visiting each of the dairy-establishments of my district, of which almost all the proprietors and makers are members of this association.

This tour of inspection taught me that the manufacture of cheese has certainly improved since last year; but there is still much to be done before we arrive at perfection, and this as much on the part of the proprietors of the factories and their makers, as on the part of the patrons.

To the proprietors I would say: try to improve your buildings, especially your drying rooms; take care that your factory is provided with the materials necessary to the production of first-class goods. As regards the the great majority of the makers I earnestly beseech them to redouble their precautions, from the reception of the milk to the delivery of the cheese to the buyer. I address myself especially to that class of makers who, knowing the principal points necessary to be followed out in making choice cheese, are not sufficiently attentive to the minutiæ of the greater part of their operations. To begin with the reception of the milk: this should be the business as far as possible of the maker himself, who should never allow a single can of milk to enter the factory without assuring himself, either by the scent or the taste, of its state of preservation, and without ascertaining that the milk has not been tampered with either by the addition of water, or by skimming, however trifling it may have been. A table entitled, "Proof of Milk" (*Epreuve du lait*), prepared by the Secretary of the Dairymen's Association of this province, and distributed among its members, will greatly assist the makers in the use of those instruments which show the richness of the milk and which, in general, they possess

The maker ought to make known to the proper person, with all desirable circumspection, the faults he finds in the milk, and give the patrons the means of correcting them.

During the reception of the milk, it ought to be seen to that it be lightly and frequently stirred to prevent, as far as possible, the cream from rising, which would cause a loss of both quantity and quality in the cheese

Many cheese-makers are not provident enough in getting up sufficient steam in the morning to heat the milk, which ought to be set to work as soon as possible during the great heats of summer, since it is then inclined

to sour too quickly. In cooler seasons, it ought to be heated from the moment of its reception, in order to ripen it, so as to delay as little as possible the mixing in of the rennet ; for we know by experience, that the longer the curdling of the milk is delayed, the greater is the loss of butter ; and this is why I advise the makers to light the fire early, at every season ; at the time of the great heats, that the putting of the rennet to the milk be not delayed ; in cooler weather, to hasten the ripening of the milk and to retain it at about 90° F. during its reception ; but as it is difficult to cool this milk down to 86° F. (the proper temperature for adding the rennet), I would recommend the maker to keep the can about to be weighed full of cold milk, to be poured into the vat when the milk already there is sufficiently advanced, in the maker's judgment, towards the state of readiness for the rennet. As I only intend to treat on certain considerations relating to the actual *making*, properly so called, of cheese, I will at once proceed to the moment when the cheese-maker is about to arrange (*relever*) the cloths that cover the cheese in the moulds. This is often done carelessly, the cloths not being sufficiently stretched on the sides of the cheese, and, consequently, the cheese cracks, etc. These cloths are often too long, and should be so cut as only to cover the end (*bout*) of the cheese by about an inch. Care should be taken that the wooden covers placed on the curd in the moulds be large enough to avoid making *ledges* on it, which give it an unsightly appearance. When the cheese is placed in the drying-room, it should be laid down so as to repose on its entire bottom equally, which will preserve its perfect shape. When the cheese is to be boxed for sale, the boxes must be good ones and cut down to at least the height of the cheese to be contained in them, to ensure solidity and economize room.

As to the boxes, I regret to say that many of those who manufacture the wood for them are most flagitiously dishonest, sending it out either of damaged quality or too short ; thus the buyer has either to make inferior boxes or to suffer the loss of the cost of the wood.

I have observed one thing common to most makers : they are afraid of using water, especially clean water ; the washings up in a cheese or butter-factory are, it seems to me, a very important matter.

Beginning with the water used in these washings up, I may say that it is rather suited to *dirty* than to *clean* the tools, etc. Is it not true that, as a general rule, part of the utensils used in the factory are plunged into the vessel used to heat the water in ? whereas this vessel ought to serve as a receiver and not as a wash-tub ; thus, even supposing the water to have been clean in the morning, which is not always the case, by the end of the day it will have become greasy and quite unfitted to wash those things that demand especial care, particularly the milk-vat, &c.

One thing much neglected by some makers is the milk-strainer, especially when it is made of cotton; it is often so badly washed that after a few day's use it acquires the colour, though not the odor, of the orange. I do not wish to discourage those who read these observations, and, as a consolation, I will state that, in this as in other respects, there is a marked improvement visible.

Were I not afraid of making some people discontented, I should be glad to point out more than one factory kept in such a manner as to cause jealousy to a great number of makers who, unfortunately, do not care to show that it is a dairy they have in charge, and that they take a pride in keeping it in good order, not only by keeping the interior of the building as clean as possible, but by preserving the utensils, such as the milk-vat, &c., in a proper state, without neglecting to keep their own persons as clean as befits the work they are employed in executing. Behaving thus, the maker can, when necessary, blame careless patrons without fear of having to suffer blame himself. Besides this, cleanliness is one of the great secrets of success.

The first cause of the inferior quality of some of the cheese and butter made in our factories must be attributed to the raw material employed: that is, the milk. On this account, I beseech the patrons to take more care of it while it is in their possession. Besides this, the cows should have pure water and wholesome food, the milking should be conducted in the cleanliest way, and the milk strained and aerated immediately, and afterwards kept in very clean tin vessels. And this leads me to speak of the cans in which the milk is carried to the factories, which are, it must be confessed, badly, nay, even very badly washed. It is rare to find one from the joints of which sour milk cannot be scraped off with the nail. One part of the can which is often foul is the ventilating tube in the cover. Another cause of milk being spoiled before it reaches the factory is the use of cloths to stanch the cover of the can; these are seldom well washed from spring to autumn.

To this it will be objected that much milk is often wasted from the cans on the way to the factory; but there are other means of preventing this loss, either by having a double cover to fit in over the top of the can, or a simple band of tin, soldered to the inside at the top of the can, so that the neck of the cover shall fit in between this band and the can itself. Another plan is to make the can with a moulding or belt in place of the band I just mentioned, so that, the cover sitting on this moulding or belt, the milk will not escape.

Another cause of the difficulty of keeping the cans clean is the bad habit some people have of not emptying the cans of the skim-milk or whey they bring back in them from the factory. How often have I seen,

even at the close of day, well closed cans still standing by the wayside! I need not tell you that, under these circumstances, it is not needful to go and see if these cans have whey in them: the thing is clear enough; it is certain their owners have not emptied them, washed and carried them to the roadside to have the trouble of coming and carrying them back to the sheds again to receive the evening's milk. No, this is what happens in such a case: at milking time there is not generally in farm-houses a supply of hot water, so the contents of the can, by this time as sour as vinegar, are thrown out, the can is rinsed with a little cold water, the job is done, and the milk all hot from the cow is poured into the can and passes the night there. How can milk treated in this fashion be preserved in perfect condition? And yet, we all know that first-rate butter and cheese cannot be made with inferior milk!

At what temperature is milk often kept? At that which Providence pleases to send us, hot or cold; there are by far too many who, during the hot season, neglect sinking the milk, while at the farm, into cold water; on the other hand, some think to gain this end (cooling) by putting water into the milk.

I shall be told that the maker ought to find this out, and inform the proper person of it; true enough, but we know that competition, not to say opposition, which obtains almost everywhere to-day, places the proprietors of certain factories in the awkward position of fearing to see their patrons carry their milk to a neighbouring establishment. To these I say, that if their patrons, after having been gently spoken to, will not alter their proceedings, they should let them go elsewere, and they will see that if their neighbour receives the milk of the negligent and the dishonest, it will not be long before he is sorry for his folly.

Creameries.

All that I have said, as regards cheese-factories, about the buildings, the care to be given to the milk, and the cleanliness to be observed in all the operations from the milking of the cow to the conversion of the milk into the finished product, applies, if possible, still more rigorously to creameries. These establishments are for the most part in trouble, chiefly on account of imperfect buildings and the want of a sufficient provision of ice to obtain at all times the necessary temperature. We must not forget that the points essential to the production of good butter are, above all, a properly built factory, cleanliness, and a low temperature. The want of this last is one of the main reasons why on the whole it is best to sell butter as soon as it is made,, especially in the first months of summer.

In my report of inspections for 1887, I observed that our cheese-factories

were more neglected than our creameries. This is not so to-day ; while the manufacture of cheese has increased and improved, creameries have increased their numbers, but not improved their products. This is explained by the fact that a creamery is much more expensive than a cheese-factory, and that the profits of the latter are, generally, greater in hard cash to the patrons than those obtained at the creamery. As in many places little account is made of the difference in value between the skim-milk and the whey, it happens that the cheese-factories sustain a great competition with the creameries, which, not being sufficiently supplied with milk, do not justify their owners in making the outlay necessary to conduct the business satisfactorily, and to make their profits equal to those made by the proprietors of the cheeseries.

The butter-makers must be still more minutely accurate in the inspection of the milk, to find out if it have been skimmed in any way, since, though cheese can be made with skim-milk, butter cannot be. I also advise the owners of creameries to try tubs closed at each end (*système baril*), which, as far as I know, are much better than the common tubs (with covers), without being much more expensive.

I have visited this year 18 creameries against 8 in 1887. If I add to the former number those creameries whose makers or owners do not belong to the Dairymen's Association and yet are within my circuit, I find that the number of creameries has tripled in two years, while the number of cheeseries has hardly increased by a third in the same period.

Combined Cheeseries and Creameries.

I only met with one combined factory this year. It is the first I have seen as inspector, but I believe there will be more in my district next year. This is the result of the greater profits the patrons of these combined factories obtain compared with those earned by the simple cheeseries or creameries ; for the money earned in butter from the milk covers more than the difference between the price obtained for full-cheese and for that partially skimmed, although the yield of cheese on the combination-plan is, of course, less. I repeat what I have already said more than once : as long as the makers of half-skims find a better paying sale for their goods than for full-cheese, there is no use in crying out against skim-cheese. Wherefore, if the purchasers are of opinion, as they nearly all are, that we shall lose our reputation as cheese-makers if we yield to this scheme of making half skims, they ought not, illogically, to buy such cheese for exportation, since their reputation is concerned as well as that of the producers, seeing that they make a speculation of this description of goods.

Of Sales.

While speaking of vendors and purchasers, permit me a word on the sale of these goods.

In my opinion, there is, in many a place, a bad way of making sales; and this is how they are carried out: when the goods in question are ready for sale, a man is sent by the factory to make a deal with the Montreal tradesmen, who, naturally, seeing the goods at their door, and obliged to be sold, buy them at, or nearly at, their own price: it is the buyer, not the seller, who makes the price. If the custom of carrying one's goods to the market for sale must be observed, it seems to me that affairs ought to be so managed that one man only should be entrusted with the combined sale of a whole district, thus economizing a good deal of expense for travelling, loss of time, &c. I think it would be wiser to sell the goods at the factory itself, either by letter at sight (de viser), after having previously ascertained the market quotations; or, as it is sometimes difficult to get at the real market-prices, by the system followed by certain experienced men, that is, to sell one's goods by commission, having previously assured ourselves of the solvability, honesty, and experience of a man who sells on commission and in no other way. It must be well understood that, if this plan be adopted, the goods must be sent in to the dealer every month at least, or even every fortnight, for he generally has a better place than the factories for the proper keeping of the goods entrusted to his care.

The whole humbly submitted,

Saul Côté,

Inspector of Cheese-factories and Creameries.

Quebec, November 25th, 1889.

THE MANUFACTURE OF BUTTER.

BY MR. J. D. LECLERC.

Butter is the gathered-together bodies held in suspension in milk, to which salt to the taste of the consumer is added. Such is the pure and simple definition of butter. The whole proceedings employed in extracting and uniting these fatty matters constitute the process of manufacture. Allow me to describe this in a few words:

We need only speak of cream from the centrifugal machine, for we have arrived at such a point in our butter industry that other plans may

be neglected, as in a very few years they will only be used in private dairies.

When leaving the centrifugal machine, the cream, then at a temperature of nearly 80° F., must be immediately cooled down below 62°, to prevent its acquiring its proper degree of acidity until 36 hours after its separation from the milk.

During the 10 or 12 hours previous to churning, the cream should be allowed to rise to the proper temperature of 54° to 64°, according to the temperature out of doors or in the dairy. The separated cream must be cooled, because if left to itself, especially in summer, it would soon, too soon, become harsh, and this harshness is a sure precursor of inferior butter. It would be the same were the cream not sour or acid enough, and this desired degree of acetification is only to be secured by a gentle action, a gradual change in the whole mass of the cream.

To work this change equally throughout the whole of the mass, and, to render it as homogeneous as possible, the cream must be stirred several times a day. These repeated stirrings have the effect of ripening the cream equally, and of giving access to the air, and this double result is essential if we wish our butter to have that delicious aroma inherent in all first-class butter.

The equal ripening of all parts of the cream is essential, because it serves to disengage more easily the fatty matters from the pellicles that envelop them. The result obtained by numerous experiments shows, too, that the yield of butter from a certain quantity of cream depends upon its ripeness.

The cream, treated as I have just described, is then put into the churn and the separation begins.

It was stated last year that the swifter the motion of the churn the greater was the yield of the butter.

The yield, gentlemen, has nothing to do with the pace of churning. The pace must be regulated by the fluidity of the cream, so as to allow it to fall on to all the sides of the churn, to receive all together the same shock, to arrive at the same degree of disentanglement at the same time, and consequently to ensure the complete extraction of the whole of the butter contained in the cream.

The shock of the particles against one another produced by the movement of the churn breaks the pellicles which envelop the fatty matters. These matters show themselves first in the form of almost imperceptible little grains; then, bought into contact by the motion of the churn, they gather together, and as soon as they attain the size of a grain of wheat, the

churning is finished. The buttermilk is then run off through a sheet of tin pierced with holes, like a colander, and pure water, more or less cold according to the temperature of the circumambient air, is introduced. This water must be cold enough to prevent the grains of butter from sticking together. And by travelling round and round in the churn, this water carries off the little quantity of butter-milk that may still remain in the butter.

Here, gentlemen, the manufacture of butter, properly so called, ends, and those who like sweet butter will find it delicious; but the salting is another important operation both as regards the flavour and the preservation of the butter.

Then, the butter is spread in a thin layer on a table made expressly for the purpose: a certain weight of fine salt, from half an ounce to an ounce to the pound of butter, is scattered over it; the layer is folded in two, and the work of mixing it by means of the roller begins and is continued until the salt is perfectly incorporated with the butter. How many times should this operation be repeated? Three or four times are amply sufficient, if the work has been well done.

It must be thoroughly understood that this working is not to get rid of the buttermilk, but to mix in the salt. For the butter ought to leave the churn, after the washing, absolutely pure, and free from the least particle of buttermilk. To work butter over the second time is an ancient error from which science has now freed us, for the more butter is worked after washing the more is it deprived of its flavour and keeping qualities.

You have now heard, gentlemen, a condensed statement of the experience I have gained and the investigations I have made during the last five years that I have rather specially devoted to the preparation of butter. This experience I am happy to impart to day to this great and notable meeting. I am glad that, in choosing me as a lecturer, the opportunity has been furnished me of paying, as well as I can, my tribute of thanks for the honour of being elected a member of the Dairymen's Association of the province of Quebec. However void of merit my humble essay may have been, believe, gentlemen, I have put all my heart and intelligence into it without restriction.

J. Damien Leclerc.

DISCUSSION.

Mr. Barnard.—If the meeting would not consider me a chatterbox, I would like to add a few words. The Commissioner of Agriculture is present. It is the first time since he has been a Minister that he has given up

his whole time, which his colleagues might have wished him to devote to the privy-council, to listen to our addresses and lectures. I beg to tell the Commissioner that this Dairymen's Association of the province of Quebec, which only began eight or nine years ago to fashion men like those we have heard to-day, has fashioned others like the man I see before me, Mr. Lord ; men who are familiar with both languages, who have studied the best authors ; men like these would do honour to any country ; they know what people are talking about, are writing about, in the most advanced countries.

Mr. Leclerc asked me a question this morning and I did not observe that he introduced it into his lecture : it referred to the production of the best butter in our country parts where there are no creameries. I hope this question will be treated. In the mean time, Mr. President, I must beg Mr. Lord not to be too modest, but to rise and begin the discussion of the question now before us.

Mr. Aime Lord.—For several years, the Dairymen's Association, through its annual meetings, has largely promoted the progress of agriculture and the manufacture of butter and cheese in this province.

At these meetings, the attendance at which is always numerous, lectures are given on the improvement of the cultivation of the soil, on the mode of producing the food and of improving the breed of our cattle, on the breeding of milch cows, on the manufacture of butter and cheese, &c, &c.,

The information acquired, the experiments and investigations carried on during the course of the year, are at these meetings related and discussed ; questions of the greatest interest are debated ; and thus light is thrown on an art of which we are not absolutely ignorant, but of which we have still a good deal to learn.

Especially are the discussions on the lectures important. It is by debating these questions, by examining each subject minutely, that we shall be in a position to utilize the information necessary to the improvement of our dairy-products.

Consequently, I will limit myself to putting questions to certain persons present, whose opinion I desire to know, about certain points connected with the subject of churning.

Churning ; that is the point we are about to discuss.

Penetrated with the conviction that the act of churning is the most important act in the process of making butter, and that if there is any operation that being improved could tend to work an improvement in the quality of butter, that operation is the churning, I, entertaining this conviction, trust that any one at this meeting having any suggestion to make on the subject will freely impart them to us.

1st question : At what temperature do you generally churn your cream in summer ?

Mr. LECLERC.—According to my idea, it is rather difficult to lay down any positive rule as to the best temperature for churning. As in cheese-making, we must always pay attention to the external temperature. Thus, what may be called an average temperature would be 58° ; but, if the heat is very great, we must naturally count upon the cream getting warmer, and, in that case, it must be put into the churn at a lower degree. So, if the external temperature is low, the heat of the cream must be higher, since the outside cold will tend to lower the temperature of the cream.

MR LORD.—Your aim in taking a temperature of 58° for the formation of the granules of butter is, I presume, to obtain the degree most favorable to their production and to the washing ?

Mr. LECLERC.—Certainly ; I believe that this temperature is the best for the formation of the granules and renders the subsequent process of washing easier.

MR. LORD.—Consequently, be the external temperature high or low, it is most important that the temperature of the cream be so controlled as to produce the granules at an average temperature of 58° ?

Mr. LECLERC.—Yes.

Mr. LORD.—Is there any other cause than the temperature that may affect the formation of the granules ?

Mr. LECLERC.—To make the best butter, not only must the temperature be right, but the condition of the cream must be perfect. As to the direct question : is 58° the best average temperature for churning ? the answer is : yes ; but, even if the butter is produced in granules, it by no means follows that the butter must be always of the finest quality. The other conditions must be correct. The milk and the cream must be good, and the latter well mixed. With these precautions the butter will be good, too.

Mr. BARNARD.—Before going any farther, I will ask these two gentlemen if they can make as good butter with poor as with rich milk.

Mr. LORD —If the milk is so poor that hardly any cream rises, it is very difficult to get good butter from it.

Mr. BARNARD.—I am speaking of good, of superior butter. You will allow that if our butter now-a-days is not of first-rate quality, it will fetch no price on the market. Not only must it be good, but it must be of the very best, so that it may retain its quality when it reaches the foreign market. It is therefore important to know if you can in your creameries make the finest quality of butter from very poor milk ?

Hence arises the importance of selecting better cows and keeping them

better, so as to have milk that shall be rich, pure-flavoured, and in the best condition. If you say that you are so skilful that you can make good butter with inferior milk, we'll send you plenty of it.

Mr. LORD —We, in our position, cannot make such experiments. We receive the milk mixed ; the different milkings are not kept separate.

Mr. BARNARD.—But, in our position, would you not prefer rich to poor milk ?

Mr. LORD.—Naturally.

Mr. CHAPAIS.—A few years ago, I visited a part of the country where the cows were in very poor condition, as poor as they could be and yet live, and I entered a factory kept by one of the best possible makers. It was in August, at which season the butter is usually good and of a good colour. That maker's butter was faultless, except that, though it was in the middle of August, it was white. I made inquiries, I asked questions, and all agreed that, when the milk is poor, its butter has generally no colour. It is a defect in poor milk. This answers Mr. Barnard's question.

Mr. TACHÉ.—Perhaps Mr. Chicoine will tell us at what temperature he churns. Observe one thing : when churning is spoken of, it is presupposed that all the conditions previous to the churning have been properly attended to. We take it for granted that every one has so treated his cream up to that point as to have it in the best possible condition for churning.

Mr. CHICOINE.—In summer, except in the great heats, I churn at 56°. In the great heats, at 58°.

Mr. LECLERC.—I have a word to add to M. Chapais' remarks. Sometimes, we have an opportunity of taking samples of the milk of different patrons in order to learn what kind of milk we are receiving.

Mr. BARNARD.—Hear ! Hear ! This seems to me important.

M. LECLERC.—A certain patron used to bring us milk very rich in cream, and which gave, on testing it, a good number of spaces on the gauge (*éprouvette*), and yet had not a good colour. How much difference there was in its yield of butter I do not know, but I should like you to observe that here was an instance of a milk that gave a good test by the creamometer, and yet was inferior in colour to another milk that tested worse.

Mr. ALLARD.—Was it the cream or the butter that was pale.

M. LECLERC—There was no butter ; it was only milk the cream of which we allowed to rise.

Mr. BARNARD.—Those who make butter at so much a pound only ask for one thing : the payment. But we who have some cows that give very poor milk and others that give very rich milk, it is important to us to know the difference. If we give you very rich, and our neighbour gives

you very poor milk, it is important to us to know if you employ the means to pay us according to the richness of our milk, and if it is the interest of the farmer to furnish you with rich milk. I will give you regular percentage, but I want you too, to give me a percentage ; I want you to pay me for my hundred pounds, not as if my milk were poor, but as if it were rich.

I desire to draw your particular attention to this question. Have you observed that rich milk gives more butter, better butter, and finer looking butter ?

M. LECLERC.—As Mr. Lord remarked, we have not been in a position to make experiments on the different qualities of milk.

Mr. BARNARD.—The Trappist Fathers are present ; perhaps they can enlighten us on the subject. I have been told that the milk of their cows is so rich that it has to be churned by itself.

FATHER ANTOINE.—We do not churn our own cows' milk alone. As far as possible, we pay each patron in proportion to the value of his milk, at least according to the quantity of cream in it.

We make almost daily tests of the value of certain samples. We make them *approximately* daily, and, in addition, we make them with all possible exactness once a week ; and, thus, during the last two years, we have paid each patron according to the value of his milk : there is a considerable difference in the values.

Mr. BARNARD.—What difference is there, Father?

F. ANTOINE.—As much as 6 per cent.

Mr. BARNARD.—And taking your own milk into comparison ?

F. ANTOINE.—The milk of some of our patrons is as good as ours.

M. CHAPAIS.—What is the poorest in quality ?

F. ANTOINE.—In some conditions, we have milk that takes 30 lbs., to the pound of butter ; others 18 lbs., and even less. Many things must be considered : the time of year, &c. There are times when the butter is always richer ; depending, no doubt, on the breed of the cows, the nature of the soil they graze on....

MR. BARNARD.—On the food ?

F. ANTOINE.—On the food.

Mr. TACHÉ.—You stated that the difference between rich and poor milk was sometimes as much as 6o/o. Does that mean that supposing the average attained by the patrons to be $1.00, some would receive only $.94 and others $1.06 ? That makes a difference of 12o/o between the maximum and the minimum, or 6o/o of variation above and below the average.

F. ANTOINE.—There are animals precisely of the same breed and fed

exactly in the same way, whose yield in milk is very different. That depends upon the soil. We have several farmers who feed their animals well and yet their milk is always poor, while others have rich milk.

Mr. TACHÉ.—Mr. Chapais was talking to me yesterday about the various regions ; "It would be better," said he, "to establish creameries in such and such a region than in such another one, because the soil there is different. For instance, our pastures at St. Denis are better than those on the hills."

Mr. BARNARD.—The Father Trappist has just told us that it is possible to judge approximately of the value of milk. As soon as this fact becomes known practically, we shall find means to supply the defect of nature, and he who finds his farm situated in a region where the soil is inferior, the moment he finds that the maker pays for his milk in proportion to its value, will buy cotton-seed cake for his cows. In England, in this way, land that grew absolutely nothing has been made to grow wheat. Rye, turnips, linseed cake were used, and thus the *blowing-sands* of England have been converted into the best land in the world.

From this discussion, it would appear that in the future the makers must, like the Trappist Fathers, settle the value of our milk when it is taken to the factory, and pay for it in accordance with its richness. And when you will do so, Messrs. Makers, we will give you a double quantity of milk of double richness ; for we shall be well paid for it, and by expending one cent we shall make three.

When I began to speak about butter and cheese-making *officially*, it was in the county of Bagot. I said that $25 a year might be made by each cow. They laughed at me. "How on earth, Sir," said they, "can you make out that the cow that will only sell for $8 in the fall, will bring us in $25 in the summer? Do you take us for fools? We keep cows because we cannot do otherwise. There must be milk to feed the calves with : calves we must have to supply the market with, and we keep cows to breed calves." To this I replied : "True enough, but I know people, people I have seen with my own eyes, who, in the province of Quebec, make $40 a cow." And I mentioned Mr. Moïse Ducharme, or rather Madame Moïse Ducharme, one of the first cheese-makers in the French country, who was then making from $40 to $50 a cow. When I said this, at the beginning of our dairy-industry, in 1871, 1872, I was told : "It's all very fine talking ; you are paid by Government ; but, anyhow, don't tell lies." Now, tell me, is what I said true?

Mr. BERNATCHEZ.—On the Island of Orleans, a cow, belonging to Mr. Blouin, gave last year 414 lbs. of butter, in addition to $50 worth of milk and cream sold. The farmer from whom she was bought did not think much of this cow.

Mr. TACHÉ.—I fancied the Rev. Father Antoine wished to keep secret the means adopted in the Trappists' creamery to determine the comparative value of milks. I must say that if the same means were entrusted to all sorts of people, or to others than monks (*religieux*), they would not, perhaps, be welcomed everywhere.

Mr. BARNARD.—Give us laymen as honest as monks ; no good without that ! (Laughter).

Mr. TACHÉ.—What I have just said was not intended to convey the idea that it is impossible to pay for milk in accordance with its richness, but, only, that the best means of gaining that end must be employed, i. e., those best suited to do justice to every one. There are such means.

Mr. BEAUBIEN.—I am neither a butter-maker, nor a cheese-maker, I am only a vendor of milk, but it does not seem to me impossible to test the cream by passing the milk of each individual through the separator as it arrives.

As I said, I am a seller of milk, and what do you think happened to me ? I had a man in my employment who used to sell my milk, and whom I had to discharge because I found that he was robbing me. "I assure you, Sir," said he to me one day, "that I never stole any of your milk ; I always paid over to you the *milk*-money, what I kept was the *water*-money." (Laughter).

Mr. BERNATCHEZ.—When you receive the milk hot, on Saturday evenings, do you find it contains more cream than when you separate every morning the mixed milk of the morning and evening milkings ?

Mr. LORD.—It is three years since I separated warm milk.

Mr. LECLERC.—I have never had an opportunity of separating warm milk.

F. ANTOINE.—(Addressing the Trappist Brother). Have you observed a greater yield on Saturdays ?

THE F. T.—Yes. On Saturdays there is always more.

Mr. TACHÉ.—In spite of prejudices existing in the minds of some people who are considered authorities, the authors, among others M. Duclaux, with whom both Mr. Chapais and Mr. Barnard are acquainted, and moreover, the analyses entrusted to Mr. MacFarlane, the analyst to the Dominion Government, prove that the evening's milk is richer than that of the morning. This is due to the food, and to the greater interval that elapses between the morning and evening's milkings. During harvest, for instance, the cows are milked at 5 A.M., and at 7.30 or 8 P.M.

Mr. BARNARD.—If the milk is cold in the morning, unless you can

warm it up to the natural temperature of 98°, you cannot get the cream from it so quickly with the separator.

Mr. TACHÉ.—True ; but, in passing the milk through the machine less rapidly, you can get the same amount of cream. And thus, when the skimming is done in the evening, a certain determinate duty is imposed on the machine. At the creameries, milk is only delivered once a day ; it is ascertained by practice that if you pass more than a certain quantity of milk through the machine in a given time, you will do so at a loss. With the evening's milk alone, the quantity may be increased by 50o/o. Contrariwise, if you skim 1500 lbs. of warm milk, you can only skim 1000 lbs. of cold.

Mr. BARNARD.—Would it not be advantageous to find means to skim twice a day ? For this reason : with cold milk, you admit the pace of the separator must be slackened from 26 to 30o/o, if you want to get all the cream. That is not to the interest of the maker. His interest is to go to dinner. I want to arrange matters so that he can dine at his accustomed hour, and, at the same time, that the proper quantity of cream shall be obtained.

There are factories where the milk is received twice a day, and I think that this is really the surest plan to go upon. In the first place, it has the effect of deterring thieves. When you get your milk warm, and behave as Mr. Beaubien's man did—put water to it—you can be caught at once. When a fine, thick cream is found on the pans, people say : "Oh ! the maker won't find us out ; we'll keep the cream for the children ;" and thus the habit of skimming is begun. I have heard it said that in Ontario, even the deacons, the ministers that is, skim their milk. (Laughter).

Mr. BERNATCHEZ.—I should be glad enough if the milk were delivered twice a day. Now, I want to know if, when you skim your milk in the morning, the evening's meal being mixed in it and the milk often being rather stale (*avancé*), can you get as much cream from it as if it were skimmed when fresh ? Is there a great difference in the yield of cream ?

Mr. TACHÉ.—The question, then, resolves itself into this : the two meals being mixed, and the milk being consequently stale, is less butter got from it than when each meal is passed separately though the machine ?

Mr. LECLERC.—In my opinion, all the difference there is in skimming the milk when warm, that is, just drawn from the cow, is that a greater quantity can be skimmed in an hour by the separator, but no gain is made in the amount of butter extracted from it. When the skimming of the two meals, mixed together, is properly done, I am positive that none remains behind, and that as much cream or butter is obtained as if the two meals was skimmed separately.

Mr. BERNATCHEZ.—Still, you will allow that the milk is not quite the thing ?

Mr. LECLERC.—My experience on this point is, that when any one delivers milk a little stale, I retain a certain percentage, according to my judgment, according to the degree of staleness of his milk. I have tried an experiment with very stale milk ; I passed it through the separator by itself, and I found that it could not throw off its cream. Therefore, if milk has begun to sour, to get stale, it would be impossible it should throw off its cream, and the staler it is, the less cream will it produce. In consequence, I always make a deduction proportioned to the degree of staleness of the milk.

Mr. BERNATCHEZ.—That is just what I wanted to know. This will compel us to have the milk delivered twice a day. Some people take more care of their milk than do others ; there will always be a pretty considerable quantity of very stale milk delivered during the hot weather ; then, less cream is yielded, both maker and patron suffer, and the worst of it is that they say : "It does not pay to take milk to the factory." If the milk is badly cared for, and a certain amount of cream thereby lost, the patron cannot be so well paid as if his milk had been dealt with at the right time.

As to paying the patrons according to the richness of their milk, I do not see how that can be done except by passing a law to that effect. Mr. Chicoine was obliged to give up this plan, because his patrons went elsewhere. Those who have poor milk will not submit to this rule ; they will not believe that their herd is inferior to their neighbours'. To compel all to submit to this rule, a law is necessary.

Mr. SAÛL CÔTÉ.—The question of skimming fresh milk with the separator has interested me very much, and the more so since this summer some makers told me that they got a less yield from the Saturday night's milk, than from the usual two meals mixed. I maintain the opposite to this ; still, they persist in saying that they positively get less yield on Saturday evening, every time they skimmed fresh milk. Mr. Chicoine said the same thing, i. e., that he got less yield from the Saturday evening's milk than from the two mixed meals. I should be glad if all the makers who use the separator would keep an account of the experience they may gain about this matter and relate it to us at our next meeting, in order to settle the question : whether sweet or sour milk gives the greater yield.

Mr. TACHE.—Does your question mean : does the machine skim warm milk more easily than cold ? Or : is cream skimmed from warm milk more difficult to manage as regards its preparation for churning ?

Mr. Côté.—My question only concerns the yield and the facility of skimming.

Mr. Taché.—I will put the question in another shape: do you mean to say that certain makers assert that if an analysis were made of the milk skimmed on Saturday evenings, more cream would be found in it? All the separators on the market, unless the contrary is expressly stated, have invariably their skimming power estimated in terms of warm milk. The dealers in these machines should warn customers that when stale milk is to be dealt with, the quantity passed in an hour must be diminished by 15 to 33o/o.

Mr. Cote,—They told me that the patrons found cream on their Saturday evening's milk.

Mr. Tache.—That, in general, I hold to be an impossibility; but the Saturday evening's milk is always more mucilaginous, more gummy, because it is fresher, and the effect of the separator is to produce froth on the skim-milk: but there is no cream on it.

Afternoon-Session.

Mr. Lord.—On the question raised by Mr. Bernatchez this morning, whether stale milk yields less than fresh milk, I agree entirely with Mr. Leclerc. Formerly, I used to deal with stale milk without making any deduction from the weight; and when I had three or four cans of stale milk mixed with sweet, I generally found a decrease of from a pound and a-half in the yield; that is, whereas I used to get a yield of 21 pounds with fresh milk, it took 22 pounds or 22½ pounds with sour. In consequence, I was accustomed latterly to deduct from the weight of any milk that was not perfectly sour though a little stale, and debit the deduction to the patron who sent it; and this, I found, gave the best results.

I have one or two more questions to put to Mr. Leclerc, if he will be good enough to answer them.

He told me, in conversation, that he skimmed his milk at a percentage of 13 to 15, instead of taking 20. Why so?

Mr. Leclerc.—For more than one reason. One is, that the patrons prefer receiving a larger percentage of sweet milk than of buttermilk. Another reason is that you always get more. Naturally, if you take a greater percentage, the bulk of the cream is much larger; you fill your churn, if the quantity is considerable, with hardly anything but buttermilk, and you know that if the churn is too full the cream must be divided into two churnings, or else the butter will not come.

I have also observed that the quantity of butter obtained is certainly quite as great.

Mr. LORD.—I have no doubt that, as regards the satisfaction of the patrons, this system is preferable. Now, as to the yield, is it the same ? I tried both plans myself, and I found no difference, but I made no special experiment on this point. One question remains to be explained : can you get as fine granules with thick as with thin cream ?

Mr. LECLERC.—If the cream is thick and quite ripe, if the ripening has been well managed, in neither case will the butter, in my opinion, suffer.

MR. LORD.—With thick cream, treated as you say, do you not find the butter has a tendency to *clot ?* Does not thick cream require greater watchfulness towards the close of the churning than thin cream ?

In thundery weather, I have always remarked that, without any apparent cause, there was a certain variation in the formation of the granules of butter, that is, I could not get a round grain of regular size, even after having observed all the conditions necessary to produce that effect.

Mr. LECLERC.—True. If the cream is thick, the pace of the rotation of the churn must be slackened, to allow time for the cream to fall well against all sides of the churn. If the cream is thick, certain parts of it will form into too large grains.

Mr. LORD.—My habit is to take 20o/o of cream in skimming, as nearly as possible. When I have the milk at the right temperature as well as the proper degree of acidity in the cream, when once the grains begin to form I do not trouble myself any longer with the churn. I have even, for experiment, had the churn turned for an hour and a-quarter, and even then the grains did not clot. This I attribute to three causes : 1. the cream was cold enough ; in the hot weather I churn it at 54° ; 2. the cream was sweet, perfectly liquid, and had attained a slight degree of acidity ; 3. it was skimmed thin.

F. ANTOINE.—Here is an experiment in churning we have been making for some time. We take pretty thick cream, and at the commencement of churning we thin it with iced-water. From this experiment we have produced the best results.

Mr. LECLERC.—What percentage of cream do you take ?

F. ANTOINE.—Invariably 20o/o. In this way, the farmers are not obliged to wait. We return to the patrons 80o/o (*of skim-milk ? Trans.*)

Mr. LECLERC.—Do you not think that by taking off the cream a little thinner than you do, and keeping it at a little lower temperature, you would get the same results ?

F. ANTOINE.—We have tried both ways, and ours gives the best results.

Mr TACHE.—What do you think, Mr. Lord, of the practice of the

Trappist Fathers in putting iced-water to the cream when beginning to churn ?

Mr. LORD.—It is a system I have never tried.

Mr. CHAPAIS.—On the subject of the acidity of the cream and of increasing the facility of churning by adding water to it, I have here some notes taken from Professor Robertson's last reports. The professor was giving his opinion on the special subject of cream difficult to churn, especially in the fall, a season when this difficulty most frequently meets us. I remember seeing, at my father's, cream churned for days together. Mr. Robertson exactly hits the question these gentlemen are now discussing. This is the first time I have seen the matter so fully expounded.

....Professor Robertson says : " The globules of butter have no skin, no pellicle which encloses them, as was for a long time supposed.

They are like drops of water or quicksilver, thrown on to a marble-slab. But, in autumn and in winter, that part of the milk called casein, the albumen, and the trifling quantity present of what is denominated fibrin, gather together round the globule, stick to it and sometimes encrust it ? thus they enclose it like a sort of gum, and by their weight detain it at the bottom.

That is the reason why cream does not rise, why the butter will not come. In this case, add two quarts of water to each pail of milk or cream, and mix the two together, and you will see the cream rise and the butter come, because the water you have added has washed the gum encrusted round the globules which prevented them from rising. You will more easily gain your end by allowing the cream to develop a certain degree of acidity. If you churn sweet cream, you will extract 77o/o of the butter it contains ; but if you let it sour before churning, you will get 97o/o. If you churn sweet and sour together, the sour will yield its butter formed, you will stop the churn, before the sweet cream mixed with the same has yielded its butter, which will be lost and poured into the pig's pail. To avoid this, mix the cream to be churned 20 hours beforehand. Temperature, too has a great deal to do with this. Churn cream at 57° to 59° in summer, at 62° to 66° in winter.

If it is too cold, the globules being too hard will not mass together. Hence, to make butter come when it is reluctant to do so, begin by diluting the cream, to diminish its viscosity, and, the further to diminish this, sour the cream ; lastly, put it into the churn at the proper temperature."

Prof. Robertson's report, 1888, pp. 45, 46, 47.

Mr. LORD.—Will Mr. Leclerc kindly tell me if cream obtained with a percentage of 13 to 15 will keep longer than at 20o/o.

Mr. LECLERC.—In my opinion there would be greater difficulty in getting it to acquire that slow acetification I spoke of.

Mr. LORD.—In this case I have found, by experience, that a 20o/o skimming is preferable as regards the formation of the granules. If, according to the practice of the Rev. Fathers, water mixed with the cream before churning has no bad effect, it would be better to skim at 13 to 15o/o. I know that by watering the cream grains may be had as perfect in form as if thin skimming were practised. According to this system, we should have the advantage of preserving the cream sweet for a longer time, by skimming thick, and the additional advantage of making the granules more perfect.

Mr. LECLERC.—I have used water, not because I was afraid that the grains would not form properly, but, when the cream being rather warm, I feared that the granules might become clotted together.

Mr. BARNARD.—At all events, you did this as a remedy, did you not?

Mr. LECLERC.—As a remedy.

Mr. BARNARD.—I believe that, in Holland or Denmark, they churn the cream as it leaves the separator ; but on one condition : 10o/o of the previous day's buttermilk is added to ensure acetification. The cream, then, is in perfect condition. There would be great danger in putting water to the cream before churning, on account of the lime it often contains. If we follow the laws of nature and avoid everything unnatural, we shall obtain the best results.

I know that in Denmark, she, who passes for the best authority on the subject, uses a separator, skims at the proper degree of thickness, churns almost immediately after skimming, but gets the right degree of sourness by the addition of buttermilk.

Mr. TACHE.—Mr Barnard knows, too, that formerly we thought butter ought to be rid of its buttermilk by the dry process, i. e., without washing. It was supposed that putting butter into water ruined it. And now the experts say that the good done to butter by depriving it of its casein by washing is far greater than any possible damage it can suffer by the introduction of lime through the water it is washed in. See Paurian, in his treatise, last edition (1888), where he says :

" As to our opinion, we will state that we are entirely in favor of getting rid of the buttermilk by means of water."

Mr. BARNARD.—And so am I ; but not of putting water in the churn during the whole churning-time, that the lime may have full time to act on the cream.

Mr. TACHE.—There is but little more danger in putting water into the churn than in washing butter.—This is what Paurian says : " I consider

the washing of butter as an almost indispensable process, to get rid of the causes of rancidity."

As to the purity of the water, that needs no discussion. If your water is not pure, you had better not use it ; but if you have spring water, entirely free from lime, you had better use it for the purpose of ridding your butter of foreign matters. As I remarked, the question is to know if it is better to introduce an infinitesimal proportion of calcareous matter into the butter, or to risk its rapid degeneration through an excess of casein. At present, the makers favor the washing of butter with water in the churn, and that is already a step in advance.

Mr. BARNARD.—On this point we are agreed ; still, I think that the authors are not agreed as to the propriety of putting water to unchurned cream.

Mr. TACHÉ.—Mr. Robertson recommends it.

M. CHAPAIS.—Yes, but as a remedy in an exceptional case. I am inclined to think that by adding to the cream water containing lime (supposing the water to be good, though it may still contain lime), the lime will exercise greater influence on the globules while they are dispersed in the cream, than when they are massed together by the action of the churn.

Mr. TACHÉ.—True enough.

Mr. BARNARD.—The washing only lasts a few minutes, while the churning last for some considerable time.

Mr. LECLERC.—As to Mr. Robertson's opinion on this matter, I must say that I have never had any trouble with my butter, if the cream was sour enough and the temperature right.

Mr. TACHE.—Besides, I fancy Mr. Robertson was speaking much more with respect to churning in farm-dairies than in factories. In farm-dairies, cream is seldom properly prepared for churning.

I wish to draw your attention to this point. Mr. Barnard stated this morning that our winters were of great advantage to us, and I consider that, as regards our creameries, it is very advantageous that a great quantity of ice should be stored. Were I a butter-maker, I would never use common water, I would use the water from melted ice perfectly pure. In winter, the principal springs that carry down lime into our rivers are at a standstill ; so that the water derived from the ice taken from our watercourses is much purer than any you can get from any source whatever in summer.

Butter-makers, then, ought, as an invariable rule, to have good icehouses, and to fill them with plenty of ice. And should the makers have to

make a great outlay to fill their houses, well ! let them get the patrons to do the work for them in the winter. (1)

Mr. Barnard.—In truth, if our Association has anything to reproach itself with as regards its part, it is not having sufficiently insisted upon the point our secretary has just mentioned. Providence has given us this advantage : we have the means of preserving that most perfect temperature, very near zero (*Centigrade?* Trans), by means of ice, and yet there are hardly any creameries in the country that begin by building an ice-house. In my opinion the ice-house is as important as a separator. You, farmers, must insist on ice being kept, and more than enough of it, too ; for where there is more than enough, there is always sufficient.

Mr. Lord.—In making butter, where a separator is used, a defect is often observed, caused by want of precaution. When the butter has been worked on the table, we often see lumps, as large as a grain of wheat, and some times as large as a bean, of a paler colour than the rest. Four or five years ago, I was told that these were the *casein* which took this form in the butter, but since that time I have discovered by practice that the sole cause of their presence is the too thick skimming. If the cream is so thickened by the separator that it leaves it by *blobs* (*bouchons*), it will not churn, and remains in the same form in which it left the separator. So, the only way to cure this fault is to watch the machine, and make it always deliver the cream in a liquid state.

M. Allard.—In what sized grains do you wash the butter ?

Mr. Lord.—When they are about as large as a grain of wheat.

To obtain all the butter possible from a churning, the cream must be all converted into butter, and the surest test of the churning being finished is, that when you draw the plug, the buttermilk runs off alone clear and brings no butter with it.

Mr. Chapais.—Have you had any experience about a fact that sometimes, to my knowledge, occurs, and complaints of which I have heard ?

It is this : the best butter, very well made, when it has been kept for some time, takes a taste of wood on the upper part, in spite of a layer of salt having been put on the butter before closing the top. Do you know of any way of preventing this ?

Mr. Lord.—Put a pound of butter into a wooden box, and in a short time it will taste of wood. When you keep butter you put a thin layer of salt on the top to preserve it ; if you look at it a few days afterwards, you will find the half of the butter bare, and the cover, which has not been scalded, will have wrought in such a manner as to cast forth the bad flavour you

(1) *Corvée*, is what was called a *base service* in feudal times—in English law—*petty sergeantry*. The queer word *sergeantry* is from the Latin, *servitium*. Trans.

complain of and impart it to the butter. When you put butter into a cold cellar, water escapes from it. Sometimes, complaints are made about the merchant's weighings of the butter; the diminution is caused by the butter contracting and parting with its water. This loss of water causes the salt to descend and diminishes the layer you put on the top.

Mr. CHAPAIS.—If the water you speak of as quitting the butter lowers its weight, can't we obviate this by steeping the tubs in salt and water, so as to saturate them with salt?

I see, in an Ontario report, that a committee has been appointed to examine the modes of salting butter, and has reported as follows:

First, in order to prevent the loss of weight I spoke of, it recommends the use of a parchment paper between a layer of salt and the cover. Salt is highly hygrometric; it attracts water, and in absorbing the water contained in the cover it carries with it the taste of wood. The parchment paper would prevent this woody taste from passing over into the butter. The second cure proposed is to keep the tubs continously soaked to prevent the moisture from evaporating.

The third plan is to use pure, clean salt, which dissolves promptly.

Fourthly, the report advises that the butter be stored in a suitable place. It often happens that in June a creamery has a lot of excellent butter which must be sold at once. If, by the means suggested by the committee, butter could be kept till prices rose, it would be of a great benefit to the creameries.

Mr. LORD.—Keeping the tubs soaking in salt and water would of course prevent evaporation; but the shrinkage I spoke of as being produced in the butter, would not be hindered thereby.

Mr. RIDDLE.—Soaking the tubs has been mentioned; at Richmond, they line them with tin. What do you think of that idea?

Mr. BARNARD.—It is a most important question; and I would suggest that, as we have an experiment-station in the province, we might ask for a trial of these tin-lined tubs, as well as of the other modes of preserving butter in good order, and for these matters to be reported on at our next meeting.

CHEESE-MAKING.

Report of the School-factory at St-Hyacinthe.

St-Hyacinthe, December, 1889.

Mr. President and Gentlemen,

I have the honour to submit to you the report of the School-factory for 1889.

During the season, 44 pupils took lessons at the factory ; they passed there altogether 109 days ; 160 letters, containing answers to enquiries, were written.

The following is the way in which I conveyed instruction in cheese-making this year :

Reception of the Milk.

I always advise the makers to receive the milk themselves, and to begin to heat it as it comes in, so that when it has all reached the factory it may be fit to receive the rennet.

Putting the rennet to the Milk.

I add rennet sufficient to make the curd fit to cut in about 30 or 35 minutes ; I cut three times consecutively.

Warming-up.

I stir for 10 or 15 minutes before letting on the steam ; I heat up to 38° in 20 minutes ; stir for ten minutes after heating and them cover the vat. I draw off the whey when the curd gives one-line threads ; stir the curd to prevent its massing ; when the whey is drawn off, I keep on stirring till the curd is very firm, and when it has become firm, I pile it up at the sides of the vat. I cut it into lumps and turn it every half hour.

Grinding.

When the curd is good and of fine appearance, I grind it in 3 hours, stirring and salting it ; half-an-hour afterwards, if it has acquired the proper odour, I put it into the moulds, but never before the odour appears. When the curd has attained to the smell of strongly fermenting cheese, it is fit for the moulds. Therefore I do not mould it until it has acquired this smell, even should it take an hour from salting to reach it. I leave the curd half-an-hour in the moulds before pressing.

For Stale Milk.

Sour milk is general in hot weather ; it reaches the factory at about 80°, and needs no warming. I add less rennet than usual ; if I put 3

ounces of rennet to 1000 lbs. of fresh milk, to get it ready for cutting in 20 minutes, I should only add 2½ ounces to stale milk, and cut thrice consecutively.

Warming-up.

Warm up, if possible, in 15 minutes ; at 90°, I begin to draw off the whey, and I keep on stirring up to 98° while the whey is running off.

As soon as the whey is all off, the curd must be stirred to get it dry as soon as possible ; I then pile it on the vat-sides, turn it every half-hour, and leave it until the fermentation is sufficiently advanced. Passing it through the mill, I salt it, and in half-an-hour, I put it into the moulds, pressing it half-an-hour afterwards.

So far have we got, nowadays, in cheese-making, that with ordinary milk, good cheese is made ; but the quantity of milk taken for the purpose is not attended to.

Here is some of the experience I have gained. When the curd is heated, it ought not to be allowed to collect in a lump at the bottom of the vat ; to prevent this it must be stirred occasionally, so that all the little pieces may form a sort of coating for themselves, and harden at the same time ; for, if on the contrary, the curd is allowed to lump itself together, and the little pieces are then broken up, there will be a loss, and more milk will be required to the pound of cheese than if my plan were followed.

A curd that is not sufficiently stirred after the whey is drawn off, expands and becomes soft, and when it is being ground the whey runs from the curd white like milk. Here, again, is a cause of loss of milk, and when the cheese ripens, small white spots, from the same defect, appear in it ; the same thing is brought about by letting on too much steam above and beneath the curd.

Porous Cheese

If, an hour after my curd is freed from the whey, I see that it is porous or full of small holes, I grind it at once, stirring it every 15 minutes, until these holes have completely disappeared ; I then salt it, and continue as usual.

The curd should never be left in the whey more than two hours after heating up, for if it remain there longer more milk to the pound of cheese will be required. This happens in cold weather ; in which case, it is proper to have in reserve, in a clean vessel, some of the previous day's whey, of which I put about two pounds to the 100lbs. of milk, more or less, according to its freshness or staleness.

Cheese, the surface of which while fermenting is like fish-scales, is

caused by the curd having been affected by cold while in the vat, or by having been put too cold into the moulds, or kept there too long without being pressed.

This is the process of teaching I have followed this year in the school-factory at St-Hyacinthe.

The whole respectfully submitted.

J. M. ARCHAMBAULT.

LIST OF PUPILS.

Joseph E. Pelletier	St-Roch des Aulnets	10
Aldéric Simonneau	Cap St-Ignace	10
J. B. Dépôt	St-Valérien	1
Désiré Bourque	St-Judes	1
Joseph Lambert	St-Jean-Baptiste	1
Louis Beauregard	" " "	1
Maxime Lafontaine	Upton	1
Edmond Laliberté	St-Simon	1
Antime Brazeau	Roxton-Falls	2
Victor Beauregard	St-Théodore d'Adton	1
Isidore St-Pierre	St-Césaire	1
Ludger St-Pierre	Ste-Brigide	1
Auguste Gérin	Ste-Edwidge	2
J.-Bte Archambault	St-Denis	3
Josehp Gendron	Coaticook	7
Louis Lacaillade	Eastman	1
Antoine Martin	St Louis de Bonsecours (C. Riche.)	1
E. Racine	St-Pie	1
Antoine Sicard	Ste-Hélène de Bagot	1
Ludgère Petit	" " "	1
Emile Chabot	Ste-Madeleine	1
Michel Desnoyers	St-Damase	1
F. D. Turgeon	Robertson Station (Mégantic Co.)	2
F. X. Bonin	Ste-Edwidge de Clifton (Co. Comp.)	6
Léopold Jacob	St-Tite (County of Champlain)	7
Euclide Sylvestre	Ste-Hélène	8
Alfred Archambault	St-Guillaume	2
P. Renaud Dumoulin	La Patrie	2
S. Chagnon	St-Paul l'Ermite	1
Onésime Mercier	St-Paul l'Ermite	2

Phidime Rochette	St-Augustin (Co. Portneuf)	8
Honoré Morissette	St-Donat (Co. Rimouski)	7
J. Adolphe Dubuc	Richelieu	1
Zoël Boudrault	Ste-Anne, Pointe-aux-Pères	2
Joseph Blanchard	St-Pie	1
Antoine Chagnon	St-Dominique	1
L. Normandin	St-Pie	1
Jos. B. Grenier	Ste-Rosalie	1
Jos. Fortin	St-Ours	1
George Morissette	Granby	2
G. Martel	Ste-Marie	2
Dalvica Adam	St-Valérien	1
Frs Vigeant	Notre Dame de Stanbridge	1
J. Bte Payette	St-Denis	1

Number of days at the factory 109

CHEESE-MAKING.

Report of John A. MacDonald, Inspector of Factories.

Mr. President and Gentlemen,

Having been appointed inspector of factories by the Association for the year 1886, I have had the pleasure of visiting 120 factories, of which 115 were Cheddar-cheese factories, three were making for local consumption, and two were creameries.

Besides these, I visited many factories whose proprietors are not members of this Association, and therefore, I have not put them on my list.

Instead of, as last year, working one day in each factory, I held thirteen meetings in the chief centres of my district : at Baie du Febvre, St. Germain, South Durham, Danville, St. Hyacinthe, St. Hugues, St. Valerien, St. Denis, St. Césaire, Granby, Richelieu, and St. Zéphirin.

The attendance was pretty large ; but there would have been many more present at the meetings, had they been held earlier in the season. They should be held in May instead of in June.

When I began my meetings, the factories were all in full operation, and the makers could not possibly come before the factories opened. If the meetings were held in May, almost all the makers would have a chance of coming before the factories opened.

Having held these meetings, I visited each factory as I did last year.

In the construction of the buildings, I found, I regret to say, that even in the newly established, those erected this year, there was not much improvement. They are still built on the old plan, that is, with no fermenting or ripening room : the most important of all. As for me, I would rather risk making cheese in a second-rate vat-room, with a good ripening-room ; for good cheese can be made in any vat-room ; while it is impossible to ripen cheese properly except in a suitable room.

A ripening room should be so constructed that the proper degree of temperature can be kept in it at all seasons. For ripening cheese, 70° are necessary, and, the heat should never exceed 75°, even in the great heats. I can safely say that out of the 120 factories I visited, there were 110 in which the ripening-room would, in hot days, have a temperature of 85° to 90° ; just 15° or 20° too high. What is the consequence ! The flavour of cheese is lost before it is ripe ; and even in some cases—pretty frequent ones, too—the flavour evaporates within a fortnight of the making of the cheese. This is the chief fault found this year by the dealers. Last summer was not a good year for cheese-making ; the temperature was very variable and the milk of inferior quality to that of past seasons ; consequently, much of the cheese was not as good as usual.

I wish to draw your attention to one factory in particular : that managed by J. B. Vigneau, and owned by MM. Brodeur Taché, and Vigneau. It is situated at St. Marcel, and is one of the best fitted up factories I have seen in the province. Those who intend to build a factory should inspect the construction of this one.

It was in the third week in August that I visited this establishment : one of the hottest days of last season. The temperature in M. Vigneau's ripening room was 75°, and I saw, the same day, others where it was 90°.

When you find cheese kept in such a high temperature, you may be sure it will be poor in flavour.

I looked minutely over M. Vigneau's cheese-room, and I could not detect one single bad cheese, though there were 160 cheeses in it. He has never any difficulty in selling his cheese, for the flavour is perfect ; want of flavour was the great cause of complaint from the dealers this year, and the whole secret lies in the ripening room. His cheese is well made, and he keeps it in good condition until it is sent to market.

Many men make very good cheese, but they have not proper places to keep it in : places that can be kept at a regular temperature, while the cheese is ripening, and, consequently, when the cheese is ready for market, it has lost its flavour, and this loss is equal to a loss of from half-a cent to a cent a pound.

This fault must positively be amended. Our cheese will never be per-

fectly successful in this country, as long as the present system of ripening is pursued.

I will point out another trouble : there is too much competition, there are too many small factories in the country. For instance, half the factories I saw were only making from 1 to 4 cheeses a day. It is impossible for the owner of one of these small places to make first-class cheese, because he cannot get enough milk, neither can he erect a proper building nor hire a qualified maker, since it would be out of the question for him to meet his expenses. The result is, that he makes a lot of inferior cheese, while, if these factories were on a larger scale, all these inconveniences would disappear. As things are to-day, if a factory does well one year, it is almost certain a rival will start up alongside of it, offering to make cheese at $\frac{1}{4}$ cent cheaper ; hence, two poor factories instead of one good one ; and it often happens that in saving this $\frac{1}{4}$ cent of the maker's charge, the patrons lose $\frac{1}{2}$ cent in the sale of the cheese ; for, as I said before, good cheese cannot be made with a small quantity of milk. Besides, dealers are never anxious to buy small lots, unless they can get them cheap ; otherwise, they won't trouble themselves about such trifles. But, with large factories, buyers are always ready to buy their cheese.

I believe this has been a most unfavourable year for milk. The patrons sent in poor milk, due chiefly to carelessness ; they thought it would be all right as long as it got to the factory.

In many cases, the maker cannot very well refuse to accept milk ; if he does, he is certain to lose the patron whose it is, for the neighbouring factory will accept it as good at once.

The best way for the the owners and makers to protect themselves is to make a general agreement among themselves to refuse milk however triflingly suspicious and to receive nothing but the purest. When milk is impure, it is impossible to keep the bad flavour out of the curd, and where that is infected, the cheese will be infected as well.

The makers are, I think, very imprudent if they warrant their cheese ; as least, unless first of all, the factory is of the first class, and then that the maker has the right to refuse all inferior milk, and to sell the cheese at the factory and not at Montreal. Although makers do not generally possess these three advantages, there are many who still guarantee their work, and I know of some who, in this way, have lost more than their wages amounted to.

One plan which is becoming very common among dealers is that when they cannot get cheese at the quoted market price, to offer a little more without seeing the cheese, which, it is stipulated, shall be subject to inspection when delivered at Montreal. There, the cheese, in their opinion, is

never worth the price offered. They will only give a nominal price, and the maker has to make up this loss.

I consider this method of dealing to be odious and dishonest.

Another objection is, that the factories are built more like barns, and have only a simple boarding round them.

I have seen factories that are very well kept; everything is clean; but in others, all is untidy and dirty, the implements carelessly kept, and the factory itself never washed down: some are really filthy. When I see such as these, I feel sure that the cheese will be inferior, and that the maker is lazy.

In almost all the factories, we meet with some second-rate cheese: this is generally the make of Saturday evening and of Monday morning.

If the milk of Saturday evening and of Sunday morning must be made into cheese, it would be better to make it every Sunday as on other days.

I know that it is thought wrong to work on Sunday, but it is not worse to work on that day than from Saturday evening to 3 o'clock Sunday morning; in spite of all that, the cheese made is of inferior quality.

All this trouble would be avoided, if we could work on Sunday morning.

As long as the old system is carried on, there will always be some inferior cheese; for it is impossible to make good cheese with hot milk, unless one has the proper quantity of stale milk to mix with it, in order to ripen it

Some makers make use of whey for this purpose; but I disapprove of this, as I think it injures the cheese. I would rather keep about 7o/o of old milk, even if it were a little sour, and mix it with the warm milk, just at the moment of adding the rennet; the sour milk ripens the fresh instantaneously, and thus the milk is brought into the proper state for making good cheese.

I have a few remarks to make on the fabrication of cheese:

After the curd is cut, it ought to be stirred for ten minutes, before turning on the steam, that a skin may be formed on the surface of the curd, and enough whey be present to keep each particle of curd distinct; the stirring should be done quickly enough to prevent it from massing together. If the steam be turned on before the curd is firm there will be a loss. This is most important. After heating-up. the curd should be frequently stirred to prevent its ever massing together.

When the curd will make threads of $\frac{1}{8}$ inch long, the whey must be drawn off, and the curd well stirred till it is quite firm. Then it is to be piled, and kept warm for three hours, until acidity supervenes: this is known by the curd becoming elastic like India-rubber. After this takes

place, it is to be cut into small pieces and allowed to lie for half-an-hour before it is passed through the mill.

The curd's temperature ought to be about 90° before it is ground. After grinding, it ought to be well stirred for 20 minutes before salting, to give it a better flavour.

Twenty minutes after salting, put it into the moulds, let it lie for twenty minutes more before pressing ; press lightly for the first hour, and then press as heavily as you please.

To press cheese properly takes about four hours' continuous pressure.

The curd should be pressed in the evening, while it is warm, for, in the morning, when it is cold, it will not mass together, and good cheese will become open.

One of the great faults I find in the cheese of this season is that the curd was not sufficiently acetified. The whey was drawn off too soon in the afternoon, which prevented the acidity from developing itself.

I have known people salt the curd when it drew out threads half-an-inch long ; whereas, it ought to give threads of two inches long, and even longer, before it is fit to salt.

If the curd is salted before it has developed the proper degree of acidity, the cheese will swell.

A porous or gassy curd demands more acidity : do not withdraw the curd until, being still in the wney, it makes threads of a quarter of an inch.

When the whey is drawn off, leave the curd alone for three or four hours, well covered, that the acid may have plenty of time to develop itself, because, without plenty of acidity, the holes will not disappear from the curd, but will remain in the cheese.

In one of the discussions on last year's reports on cheese, I remarked that one speaker stated porous curd ought to be cut as soon as the holes show themselves, and be then well stirred and aerated. Well, this is a mistake, for when the holes show themselves in the curd there is very little acidity present,, and as soon as the curd is cut and stirred it grows cold before the proper quantity of acidity is developed ; then, the curd being cooled down, the acidity works no longer, and your cheese will be porous. The only way to avoid these troubles is to obtain plenty of acidity, and to keep the curd warm for three or four hours ; then, 15 or 20 minutes after cutting, no holes will be visible in it and, consequently, the smell caused by the gas will disappear, leaving the curd firm and with a good odour. As I observed, there are certain odours that cannot be got rid of, those emanating from gas in the curd will be dissipated after cutting.

Stale milk ought to be less heated than fresh : 80° is the temperature at which the rennet should be applied.

A little more rennet than usual may be used to obtain a quicker coagulation ; then, the warming-up should be rapid, and the final heat not quite so high as for fresh milk : 96° will do ; the whey should be kept level with the curd and the latter well stirred. If the acid acts too quickly, draw off the whey, and stir the curd till it is firm.

Some makers, I presume, would like to know why more rennet is needed for stale than for fresh milk. It is because stale milk works quicker, therefore it requires more rennet in order to disengage the whey more promptly : it is the action of the rennet that separates the whey.

The more rennet you use, the sooner will the whey be disengaged.

When I have to deal with stale milk, I add from half-an-ounce to an ounce more than with fresh ; sometimes even a little more, and the results are always good.

I observed another thing in last year's discussion : that the use of additional rennet burned the curd. This is not so, never mind who stated it, and I can show that it is not ; a reasonable quantity of rennet will never injure the curd. I have seen curd that was said to have been burned by the rennet, but it was too much sour milk, not the rennet, that was in fault. The only effect that the latter can have on the cheese is that it will ripen too fast in hot weather, and lose its flavour more rapidly.

Curd ought to be fit to cut, in summer, 40 or 45 minutes after the rennet is applied, at a temperature of 84° to 86°. In autumn, 30 to 35 minutes.

With stale milk, it must be fit to cut in about 20 minutes at a temperature of 80°. Milk that coagulates in less than 20 minutes is too stale to make good cheese.

Milk is sometimes brought to the factory that, with the usual quantity of rennet, is coagulated and fit to cut in ten minutes. The maker who accepts such milk does not understand his business. Under such conditions, it is impossible to make good cheese, and even if the curd is of fair average quality, there will be a great loss, for it takes more of stale than of fresh milk to make a pound of cheese. If less sour milk were brought into the factories, less sour cheese would leave them.

I think I have said enough. I trust my remarks will be found useful to some of you, and that he who has to report to you next year will be able to show that the manufacture of cheese in this province has improved. For I see no reason why the cheese of this province should not fetch the highest price in the market. If a little more interest were taken in this

business, nothing could prevent our cheese from occupying the first place in the trade.

Thanking the members of the association for their kind attention, I now conclude my report.

I am, Gentlemen,

Your very respectful servant,

J. A. McDONALD,

Montreal.

THE MANUFACTURE OF CHEESE.

By Mr. J. B. Vigneau.

Mr. President and Gentlemen,

This is the first time since I have been a member of this Association that I have been called upon to deliver a lecture before it, and the subject I have to treat is: the manufacture of cheese.

This is not one of the least important subjects, especially to us makers, and I regret that M. Taché, your secretary, did not select some one more capable than I am of discussing a question involving such extensive interest. It is not practical knowledge that I am weak in, since I have just finished my fifteenth year of experience ; but, having only had a few months of schooling, I am well aware that I cannot hope to express myself in proper phraseology before such a meeting, composed, as it is, in great part of men who have enjoyed the advantages of a good education.

During the course of last season, out of about 500 makers of cheese, there were probably not less than 400 whom the patrons called upon to bear their share of the losses incurred owing to the cheese not turning out of the best quality. The only excuse I can make for my temerity in addressing you is that I had not to lose a cent from this cause ; which is as much as to say that the cheese I made was all of the first quality. That is why I consented to speak on the subject my partner, Mr. Taché, has imposed upon me, persuaded that if I can do a service to some of my fellow workmen by my address, I shall do myself a much greater one by benefiting by the experience of those who are about to take part in our labours. I regard myself as a pupil, well disposed to learn all that you will kindly teach me. It is to you, in particular, my dear fellow-workmen, that I address myself. You know that our success does not depend solely on our skill ; but that it is useless to strive after great success unless we enjoy the confidence of our

patrons. We have every reason to try and gain their confidence, but chiefly that, with this confidence, we can more easily induce them to put into practice those rules the observance of which is incumbent upon them, and those rules, as you well know, are intended to ensure the delivery at the factory of good, sound, milk, and of nothing else but good sound milk. First of all, our conduct towards them must convince them that we really consult their interests. Our place must be kept in the most cleanly state ; we must be industrious in our work ; always inclined to reply civilly to any question put to us by our patrons, and, above all, we must never fail to receive the milk ourselves. By ourselves discharging this duty, we shall prove to them better than by any other means the interest we have in receiving no milk except it be of good quality, and we shall throw a serious obstacle in the way of those dishonest patrons who partially skim their milk or add water to it. Were it only for this last reason, it is clear that our presence at, and attention to, the reception of the milk are absolutely necessary : for, if by our absence or inattention frauds are committed by some of the patrons, a great part of the responsibility will rest on our shoulders.

Much care must be taken by us not only in weighing the milk, but in keeping a faithful, exact account of its weight ; we must make the entries in their receipt books (*livrets*), and credit the patrons with so much in our account-books. Hasty and rough manners always impress the patrons with suspicion. Politeness and suavity are necessary at the factory as well as in society. To preserve the confidence of our people, we must behave towards them civilly. The patron has a right to know how much his milk weighs and for how much he is credited in our books. On our side, we have a right to refuse everything but sound, good milk. To succeed in this point we need a quick eye, a developed sense of smell, as well as all that experience can teach us. Much smoking or drinking in the morning are both inimical to the forming of a correct judgment of the quality of milk. It often happens that we have to taste the milk ; or that, in racking it into the weighing-can, a strong or harsh odour is perceived from the milk ; sometimes we find its colour queer : in all these cases, good sight, taste, and smell are needed, and to possess all these senses in perfection, we must keep ourselves in a fit condition, and, above all, we must be present at the delivery. It is on this constant attendance that I insist, and what I have just said proves the absolute necessity of our being present when the milk is being received. If by taking these precautions, we can ensure the good condition of our milk, we shall have made one step towards securing the good quality of the cheese to be made from it. When we make bad cheese, there can be only two causes for its inferiority : either the milk was in fault, or we do not understand our business.

I said, we must taste the milk. The time to ascertain its condition is

when it is in the large receptacle. I can say with truth that, owing to repeated trials, I know every day in what condition the milk I have to deal with is, and it happens frequently that, at very short intervals, the milk has to be treated in a very different manner. The maker who is not sufficiently experienced, who has not thoroughly learnt his business, will always make his cheese in the same way, and just as the milk varies so will it be with his cheese. When we know how to vary the methods of manufacture in accordance with the variations of the milk, our cheese will always be of the first quality. Whether from the changes of temperature, or from some other cause, the milk, once in the great vat, from day to day is in a more or less stale condition, more or less sour, in all factories; we must therefore know how to vary our treatment of it, according to the condition in which we receive it. Before going over these previous remarks I could not enter upon the details of the manufacture. The whole secret of becoming a good maker of cheese is to thoroughly investigate the secrets of the milk; this is the only guarantee we have that we shall be able every day to make the best quality of cheese.

The following are the methods I follow in making cheese; three in number, for spring, summer, and autumn.

Spring.

My method for spring, extends from May 1st to about June 15th. While I am receiving the milk, I stir it frequently in the vat to cause it to evaporate (*aerate?* Trans), and I take care to let on enough steam to bring the whole to the right heat for the rennet just as the last canful is being put into the vat. I warm the milk up to 88° before adding the rennet, of which I put enough to make the curd fit to cut in 35 minutes. Having cut the curd, I stir it by hand for some minutes, after which I let on the steam, gradually increasing it, and when the curd begins to get firm, I use the rake, and finish the heating up to 100°. The stirring I continue for some minutes, and if there is a good deal of milk in the vat, I at once draw off some of the whey and watch for the disengagement of the acid, which begins to appear. In proportion as the acid is disengaged, I draw off more whey, and stir the curd to let it *cook* equally, so that when it gives threads a line in length, there is hardly any whey above the curd. As soon as line-long threads are produced, I draw off the whey completely and stir the curd to drain it thoroughly. I cannot say how often I stir the curd; but I do it as often and as long as is necessary to drain it thoroughly.

The curd I lay in rows along the vat and cover up, introducing, if necessary, steam enough to keep up the heat to 100°, the temperature at which it was *cooked*. As soon as the curd is firm enough, I cut it in pieces,

and turn it over to the other side, rolling it over and over. I cover the vat up again, and keep up the same heat for 2½ hours, turning as before every half-hour. When the 2½ hours have passed, I look at the curd to see if it is fit for the mill, which it generally is 3 or 4 hours after the whey is drawn off, I judge of its fitness for grinding by these signs : it must be soft, shining, and elastic, so that it may be separated by threads just as one draws out the filaments of the ash-tree (*comme dans le frêne on sépare les âges par filandres*). After having thorougly stirred it, I add salt at the rate of 2¼ lbs. to the 1,000 lbs. of milk. In twenty minutes it is put into the moulds, and then goes to press. When the curd is ground, it should not be hotter than 94°.

Summer.

My summer treatment begins in the last fortnight in June, and is continued till the end of August.

The rennet I introduce at 84°, in quantity sufficient to bring the curd into a fit state to cut in 45 or 50 minutes. I then *cook* at 98°. Thenceforward, everything is done as in spring, except that, as regards drawing off the whey, I wait till the curd gives threads of 1¼ line in July and 2 lines in August. I salt at the rate of 2½ lbs. to the 1,000 lbs. of milk.

Autumn.

About the first week of September, I warm the milk up to 86° before adding the rennet, and use enough to make the curd fit to cut in 45 minutes. I *cook* at 90° and do not draw the whey off so quickly as in summer, but wait till the acid declares itself, and only draw off the whey when the curd gives threads of 2¼ lines ; at the end of the month they should be of 2½ lines.

In October, the milk is very sweet, and I sometimes have heated it up to 90° before applying the rennet, and added whey of the previous day at the rate of 4 lbs. to the 1,000 lbs. of milk. I wait till I get threads of 3 lines before drawing off the whey, and put 3 lbs. of salt to the 1,000 lbs. of milk.

It often happens, especially in the great heats of summer, that we get milk sent in in very bad condition, and most of the bad cheese made is to be traced to this cause. It is under these critical circumstances that I am very particular about tasting the milk as soon as it is all emptied into the vat. I take thorough notice of the state of the milk, and even under these conditions it is easy enough to make superior qualities of cheese if the milk is treated in the following way : if the milk is stalish, instead of heating it up to 84°, I do not heat it all unless its temperature is below 70°, and I add more rennet than usual, that is, instead of giving enough to bring the curd in 50 minutes, I coagulate it in 20 or 30 minutes,

according to the more or less staleness of the milk, I *cook* it quicker than usual, draw off whey as soon as it forms, and stir the curd continually until I get threads of 1½ lines, at which point I draw off the whole of the whey.

It also sometimes happens that the curd is full of small holes. In this case, instead of turning the pieces from side to side, every half hour, as mentioned under the head of summer, I turn them every 15 or 20 minutes, and each time I cut the blocks in two, keeping the temperatnre up to 98°. By this means I have always succeeded in getting rid of the gas that forms in the curd.

Saturday Evening.

I take care to keep the milk stirred all the time I am receiving it. I warm up to 86° before adding rennet enough to bring the curd to the knife in 40 minutes, and I introduce 8 lbs. of the previous day's whey, drawing off the whey when the curd gives threads of 2 lines. I do not grind the curd until 4 hours and sometimes 5 hours after drawing off.

Far be it from me, gentlemen, to stand here as a master. As you have heard, I have only related very simply the methods I have followed, especially during the last 5 years ; methods that have gained me the full payment of my salary, and which I have no reason to think erroneous.

Mr. President and Gentlemen,

Being anxious, as you all are, to see our Canadian factories prosperous I ask myself if we cannot always succeed in making cheese of superior quality. I reply in the affirmative.

1. We must begin by establishing two good model-factories managed by makers selected by the directors of the Dairymen's Association. The wholesale-dealers of Montreal and the inspectors are acquainted with all the factories of the province and with the cheese they make, and I think they would be the best judges in this matter. The secretary of the Association could easily get the necessary information from these gentlemen ; for example : what factories furnish the best cheese throughout the whole season of manufacture? The Association would gain even by this a vast amount of information which would facilitate its selection of competent makers to be placed at the head of these model-factories.

2. These schools of practical science must be opened every year towards the 15th April, to give young makers the advantage of frequenting them, and of being in a position, before their own factories open, of becoming acquainted with the progress and improvements which are made every year.

3. The practical means of ensuring the operation of these model-fac-

tories before the season for the working of the ordinary ones begins would be to ensure to the patrons of these model-factories a remunerative price for the milk they would have to prepare to furnish at so early a season up to the 15th May.

4. Very many makers have this year, for one reason or another, lost part of their salary by the price of their cheese. I regret this loss, since I know by experience that it is very easy for all to make good cheese. For the last 5 years, I have been a partner in the factory where I myself work, and where I put my hand to everything that is done : I have had no losses of this kind. To what then shall we attribute these losses ? Was the cheese, on the price of which the makers thus suffered them, of inferior quality ? If so, we must understand how injurious this must be to our market. To remedy this, good school-factories must be established.

I cannot conclude this lecture without offering my congratulations as well as my sincere thanks to the Dairymen's Association for having distributed gratuitously their carefully prepared and excellent bulletin. If the patrons would follow out all its instructions, the milk would certainly be delivered at the factory in such condition that the makers would have far fewer difficuties to overcome, and our cheese would stand in a higher position on our market.

Thank you, Mr President and gentlemen, for the kind attention you have granted me. I came hither to learn and not to teach, but to benefit by the experience of my masters and of my fellow-workmen

DISCUSSION.

Mr. BARNARD.—The Hon. Minister of Agriculture is present ; he is not probably aware that we have a dairy-school in existence that has done wonders, and here is the proof : one of its pupils, who, as he said, has had but little education, still has laid before us the most complete and remarkable document that has ever been read in Canada. This is due to the school-factory of St-Hyacinthe, and I think we ought to take a note of it.

The ABBE MONTMINY.—I wish to draw the attention of the meeting to the importance of this lecture that has just been read, and I beg to congratulate the author, who has shown great intelligence and described a very practical method of manufacture. I, like all true lovers of agricultural progress, should rejoice if the practical farmers of the province were present in greater numbers at our meetings, and would take a more active part in them. We get a great many compliments, gentlemen ; let me address a few words of reproach to you.

Last year, the directors were blamed for not allowing discussions to

take place. The secretary now invites every one to give his opinion on the important subjects under our notice, and I reiterate this invitation. I hope the discussion will be thorough.

M. ALLARD.—I should like to know why M. Vigneau teaches us to keep the milk at 100°. Those who have written on the subject say it should not be higher than 98°.

M. VIGNEAU.—For this reason : In spring the milk is stale ; it works generally quickly ; therefore I keep it at 100°, taking care to stir the curd continually in the whey, so as to wash it in proportion as the acid disengages itself. For milk, in spring, is generally bad ; it contains evil smells ; some of the cows happen to be ill.

Mr. BARNARD.—Badly fed, and badly cared for.

M. ALLARD.—May not this high temperature injure the fatty matters the cheese contains ?

M. VIGNEAU.—By no means.

Mr. BARNARD.—I think this is a very important question, and one that enters into the province of the farmer. We have to find out if the milk we turn into cheese in the spring is as good as it ought to be. The cowhouses are not well ventilated, the cows are low in flesh. Not only should the cows be in such condition that we have not *to lift them up by the tails*, but they ought to in a state to furnish rich and abundant milk. You will see by the table about to be placed before you, that Canadian cows, at Quebec, have yielded as much milk in winter as good cows give in summer. But, observe, that if you go into the cowhouse where these cows live, you will find no bad smell : the ventilation is perfect.

Farmers must understand that our winters—which led us to believe during 20 or 30 years that the country was not fit tor farming—our winters, I say, are absolutely a point in our favor. Feed our Canadian cows properly, and from them we shall derive good products, at all seasons of the year.

Let us bring this about, and our makers will no longer have to heat up to 100° to prevent the cheese having a bad smell.

We do not give you, Messrs. Cheese-makers, as good milk as you deserve. When you get pure, well ventilated milk, you will probably be satisfied with heating up to 98°.

(Addressing Mr. MacPherson).—The discussion now going on is about the proper degree of heat required when, in spring, the milk is not good. Will you tell us, if when in May, you receive bad milk, from a badly ventilated cowhouse, you prefer 98° to 100° for the cooking heat ?

Mr. MACPHERSON.—I regret, Mr. President and gentlement, that I

cannot speak French ; I should like to address you in your own language, and I am sure it would we much more agreeable to you.

As to the question : at what heat shonld the cooking be done, I do not think it is of as great importance, as many people do. What is of greater importance than cooking at 98° or 100°, is the temperature that is kept up during the subsequent operations.

If you cook at 100°, and then lower to 90°, you will certainly turn out bad cheese. If you cook at 95° and lower to 90° you will still turn out bad cheese. Curd may be cooked at 100° and the cheese be good ; at 95°, and still be good. The important thing is to keep the right temperature throughout the whole operation, and not solely at any given moment of time.

As the greater part of the results depends upon the temperature, it is the duty of the maker to take care to give both to the milk and the cheese the best temperature during the whole course of manufacture, from the warming of the milk to the sending of the cheese to market.

So, I do not think that there is any important difference between heating the milk up to 98° or 100°. All depends upon what follows. I mean to say, that, if you have a great deal of milk rich in butter, one or two more degrees of heat many be given to it than to poor milk. For the additional heat expels the moisture, and the more moisture is expelled, the dryer will the cheese be. I may say that 98° is a good average heat at all seasons, and every one can take this as a good temperature. But, should your experience teach you that another temperature is preferable, in your special circumstances, take that one. If 100° gives you the best results, take 100°.

I can make as good a cheese at 98° as at 100°, and at 100° as at 98°. Only if I take 100°, I must employ more heat later on. What is important to settle is, the relation to be observed between the total quantities of heat that are maintained in the various phases of the method one follows.

As to the odours sometimes contained in the milk, it is sometimes warmed up to 100°. But this I do not recommend. It requires a great deal of labour and expense, and is dangerous. The odours are destroyed by developing the acid in the cheese. A difference of two degrees in the cheese cannot destroy these smells. It is keeping the acid at a proper temperature that destroys these smells, or counteracts them, or prevents them from being developed.

Allow me to tell you that you cannot make good cheese with bad milk ; you can only improve it, make it saleable. To make good cheese, you must have good milk, that is, the cows must be well fed and well looked after.

Mr. ALLARD.– Speaking of rennet, when the milk is stale, Mr. Archam-

bault says that by putting too much rennet into stale milk, the curd is scorched ; Mr. Macdonald holds the contrary opinion.

Mr. MacPherson.—Stale milk combines two states of milk : 1 acid milk ; and, 2. milk impregnated with a bad smell. One has a tendency to turn sour, the other to take a bad taste, a bad flavour.

With milk inclined to go sour, more rennet must emphatically be used ; where milk has no special tendency to turn sour, but is inclined to take in bad smells, I should employ the usual dose of rennet, or perhaps a little less.

I should add a little more rennet to milk that has a tendency to turn sour, because of the immense importance that exists of preventing this sort of acidity from acting on the curd.

The changes that take place in the milk depend especially on the quantity of sugar in the milk, and this milk-sugar remains almost or quite entirely in the whey ; so that, when you draw off the whey from the curd, you take away the cause of the staleness of the milk.

When the trouble is that the milk absorbs bad smells, the reason why the quantity of rennet is diminished is that it is desirable to retain in the curd a larger amount of whey, and the consequence is that the curd works quicker, or at least that a greater quantity of acid develops itself in that milk. It is the acid acting on the curd that drives off the bad smell, or at least neutralizes its effects.

Cheese-makers of some experience must have remarked that when milk has a bad smell, it is more difficult to develop acidity in it ; these bad smells seem to be an obstacle to the development of the acid.

To condense the subject : there are two states in which bad milk is found ; sour milk which generates acidity too quickly and bad smelling milk which does not acetify quickly enough. The treatment, in both cases, is wholly different, because the milk works under absolutely contrary conditions.

Mr. MacDonald.—Since we have Mr. MacPherson here, who is justly styled the king of the cheese makers, I should like to profit by his presence to ask him a few questions. We know that he and the head of the school-factory differ in opinion on certain points. For example, when the milk is sour, Mr. Archambault says less rennet is required, since, if more than usual is added, as Mr. MacPherson recommends, the curd will be dry and the whey will rise over it.

Mr. MacPherson.—Let each follow the plan he has been most successful with ; but, in my ten years' experience, when the milk is stale, I find myself obliged to hasten all the processes : the heating, coagulation,

grinding and pressing. If you put less rennet, you retard the pace of the operations, while, on the contrary, by adding a larger dose you hasten it.

A MEMBER.—Will Mr. Archambault say why he puts less rennet?

M. ARCHAMBAULT.—I put enough rennet to make the curd take in 15 to 20 minutes, when the milk is stale.

M. TACHE.—Do you mean to coagulate or to be fit to cut?

M. ARCHAMBAULT.—To take so as to be fit to cut in 20 or 25 minutes. I think that is about the time I gave in my report. My own experience is, that every time I have given an extra dose of rennet I seem to have scorched the milk.

Mr. MACPHERSON.—When the milk is staleish, the rennet acts with double force. The dose need only be increased by a trifling quantity, let us say by about 10o/o.

M. TACHE.—As to this point, observe that the dose of rennet which you employ with a certain quantity of stale milk may be proportionally less powerful, although absolutely larger.

Here are some figures from Paurian's work :

Supposing you employ 100 drachms of rennet for a certain quantity of milk at 87°, if you have to set the curd at 82° instead of 87°, your dose of rennet must be increased by 25o/o if it is to be proportionately powerful. If your milk is stale, and you set it at 82°, with 115 drachms of rennet, you will have given a dose of rennet absolutely stronger than 100 drachms at 87° ; but proportionately weaker.

Mr. MACPHERSON.—I would say another word about stale milk. It will always yield a hard, dry cheese. Put to it more rennet than usual, and the cheese will be softer. Consequently, if an additional quantity of rennet tend to make cheese softer, and stale milk is inclined to make cheese hard, a cheese having the proper degree of firmnes will result from this extra dose.

M. FRS. GENDRON.—Will Mr MacPherson tell us what makes cheese bitter?

Mr. MACPHERSON.—Cheese is generally made bitter by being cooled during its manufacture. The fermentation is arrested, the cheese attains a sort of gummy consistence, and this must necessarily give it a bitter taste.

I advise you never to allow your cheese to clot together in the whey.

M. TACHE.—You remember that last year Mr MacPherson gave the same advice. Some one had asked what was the cause of spots in the curd. It is from leaving the pieces of unequal size. Why? Because, if the pieces of curd are of unequal size, they will not work equally; you will find in your cheese parts that have not worked as much as the rest. Hence, it is

wrong to allow the curd to clot together in the whey. Keep the pieces invariably of the same size, and at a regular temperature.

M. GENDRON.—From what cause arises this defect in the cheese, that it will not stick together, but remains all in pieces ?

Mr. MACPHERSON.—This comes from having used too great heat in the making, and the cheese being too dry cannot consolidate. Still, if the cheese is put into the cheese-room, and has been otherwise well made, the pieces will adhere to one another in a week.

M. ARTHUR MARSAN.—Should whey be used to ripen milk in the fall ?

Mr. MACPHERSON.—No, never.

M. ARCHAMBAULT.—In my opinion, we can preserve whey so as to be fit for ripening sound milk the next day ; only it must not be sour ; and as we only need the sugar it contains to ripen the milk, a reasonable quantity is added so as to make it fit to be drawn off two hours after cooking. I like this better than heating the milk and letting it cool again as used to be the practice a few years ago.

Formerly, I used to follow this plan, because our rennet, which we made ourselves, was not to be depended upon ; but now, with the well prepared rennet we buy, the whey is quite sound the next morning. Only it must be well understood that this must only be done in cold weather.

M. TACHE.—I will ask Mr. MacPherson this question : cannot whey be so preserved that its use will not injure the milk ?

Mr. MACPHERSON.—Whey has certainly the power of imparting acidity to the milk, but it has the disadvantage of giving, in spite of all you can do, a bad flavour to the cheese. Therefore I will not employ it.

M. VIGNEAU.—The quantity of whey used in the circumstance is 4 lbs. to the 100 lbs. of milk, and the whey is carefully preserved sound.

Mr. MACPHERSON. -By inspection, I can always tell if a cheese has had whey used in its making. It is always more or less injurious. It would be better to keep the milk for an hour or two at 86º or 90º. This is the natural change that takes place in milk and it develops aroma. If you add whey, it may destroy the aroma of the cheese. I do not advise people to use whey even in the most trifling quantities.

M. SAUL CÔTÉ.—For what purpose do you use the whey, M. Vigneau ?

M. VIGNEAU.—Because I find that, after experiments made, I succeed in this way better than in any other way.

M. TACHE.—Have you tried pure milk ? Why not keep over some milk rather than whey ?

M. ARCHAMBAULT.—Because there is a loss in it. I tried the experi-

ment in a small tub (*bac*) holding 500 or 600 pounds. I warmed up milk in the vat, as the old practice was, and let it cool. In the other, I put about 2½ lbs. of whey. The lot that had no whey added required more milk to the pound of cheese than the other.

When milk is warmed up to 90° or 92°, and cooled by stirring, a loss is the result.

M. COTE.—Mr MacPherson cares more about the quality than the quantity of his cheese.

M. ARCHAMBAULT.—We will take Mr Macdonald as judge, in his report on Mr. Vigneau's factory. The latter always employs whey when needed, and his cheese was found to be of the very best quality.

Mr MACDONALD.—At the time I visited M. Vigneau's factory, there was not one cheese in the making of which whey had been used.

M. CÔTE.—I think we Canadians are rather inclined to be greedy.

M. VIGNEAU.—I do not believe the quality of the cheese has ever suffered from this practice.

M. TACHE.—What Mr. Côté says is quite true. You all know that the Cheddar-cheese takes more milk to the pound than the old style of cheese. Still, the old way of dealing with the milk has been abandoned in favour of the Cheddar-style. When it can be done under reasonable conditions, quantity of yield must be made to give way to quality of the product.

M. VIGNEAU.—I assert that the quality of the cheese has never suffered by the addition of whey.

M TACHE.—Mr. MacPherson's statement of the case is this : when you add whey, however sound, to the cheese, you introduce a new fermenting agent, which does not exist in cheese made with milk in its natural state. I am not a cheese-maker, but if I insist upon this point, it is because it seems to me to be as easy to ripen the milk with milk kept over from the previous day as with whey.

M. CÔTE.—This is so true that, having once visited a factory where they were working on the old plan, I made the following experiment : We divided the morning's milk between two vats ; the owner of the factory made cheese in his own way, I made cheese in the other way. As the former got a greater yield from his lot than I did, it was considered that I knew nothing about my business. And yet, the next autumn, the factory-owner told me he had been obliged, in spite of himself, to adopt the new mode of working.

M. ARCHAMBAULT.—But we are not talking about the old style ; we only speak of the progress we have made.

I have a small vat holding about 700 or 800 lbs. ; before teaching

anything new, I invariably make experiments several times repeated ; and I find that there is always a loss incurred by heating and cooling the milk. If experience gives this result, why not accept it for true ?

The misfortune is that cheese is often cooked, and at the end of two, three, or four hours, the whey is not drawn off from the great vat. Cheese of inferior quality is made : cheese that when the fermentation begins is covered with a scale-like crust, and which has, besides, a bad smell. I am certain, too, that this mode of working takes more pounds of milk to the pound of cheese.

I should like no more time than two hours to elapse between the cooking of the curd to the drawing-off of the whey. I may be wrong, but I have had enough experience on this subject to justify me in the statement.

M. TACHE.—Since we are talking of experience, there is one point in which Mr. MacPherson is superior to us all : he understands the cheese-markets as well as the making of cheese. All his factories are under his control in the matter of sales, so great is the confidence his patrons have in him. And Mr. MacPherson says that, during the first months after making, the cheese may show no signs of difference if whey has been used, but later it is sure to be discoverable.

Mr. BARNARD.—When doctors disagree, it is very hard to bring them to one mind. It seems to me that the association might make trials of cheese made after each of these methods.

M. MARSAN.—Ask Mr Macdonald, then, what he thought of Mr. Marsan's cheese, made in October.

Mr MACDONALD.—As far as I remember, I found no fault with his cheese, but I have not my notes with me.

M. TACHE.—Fifteen years ago, Mr MacPherson used to put whey to his milk to ripen it. He found it produced bad results, and therefore gave up the practice.

A VOICE.—But it might have been Mr MacPherson's men who were charged with this duty ; perhaps, they added too much whey.

M. TACHE.—Well ! all the makers of cheese in the province are not MacPhersons !

M. VIGNEAU.—If they put too much, it would be risky.

M. TACHE.—That is to say, you would not be responsible for those who employ this method.

M. ARCHAMBAULT.—Would it not be possible that, either at the end of March or the beginning of April, the inspectors should come to the school-factory and pass a few days there with a view to study all the operations

employed in the making of cheese. In this way we should arrive at a well-founded decision ?

M. Côté.—It is very kind of you to throw open your factory to the inspectors of next year. It is clear that much time is gained by the use of whey, and, were I a maker, I should be tempted to use it. But Mr. MacPherson talks neither about time nor quantity ; it is quality he seeks for. For there is no doubt that in general what is gained in quantity is gained at the expense of quality.

M. Tache.—On Saturday evenings, M. Archambault, do you use anything to ripen the milk.

M. Archambault.—Some whey.

M. Tache.—Mr. Macdonald said that while he was with Mr. Archambault he sometimes used the morning's milk to ripen the milk of Saturday evening ; and we have proved this to be a good plan : milk thus employed has given good results. Mr. MacPherson says, too, that there is no danger in using milk under the same conditions provided it has been properly preserved.

Mr. Macdonald.—As to porous cheese : M. Archambault's treatment is to grind the curd as soon as possible, while my plan is to leave it 2 or 4 hours before passing it through the mill.

Mr. MacPherson.—Why do we pile the curd ? Why grind it ? The curd is piled to keep its temperature equal throughout, and it is ground solely to prepare it for salting. It is the acid, developed in the curd, that expels the gases. Now, what is it that develops the acid in the curd ? Heat. Porous curd I grind very late, because, as long as it is in the pile the heat is more easily retained by it than after grinding. I keep my curd for a long time in large pieces, and I grind late.

The porosity of the curd results from a peculiar state of the curd when the gases are developing themselves.

These gases are developed by heat in the vat ; while, if you grind your curd at once, the gases, instead of being developed in the vat, will develop themselves in the store-room and you will have a porous cheese.

M. Archambault.—From experiments made at our place, I have arrived at this conclusion : porous cheese is made during the hot weather with a temperature of from 80° to 90°. Since there is some foul gas in the cheese, I have to grind it at once to get rid of it.

M. Tache.—Are you obliged to take more precautions in this case than under ordinary circumstances ?

M. Archambault.—Certainly : the curd must not get cold.

M. Tache.—The question, then, comes to this : is it better to grind

early, not having to take additional care to prevent cooling, or to wait for some time before grinding ?

M. Archambault.—By grinding early, I have succeeded in making cheese free from bad gases, and having a fine flavour.

M. Pierre Deneau.—I should like to know how much well kept milk it takes to make a pound of cheese ?

Mr J. A. Macdonald.—In spring, in May : 10¼ lbs. of milk to the pound. In June : 10 lbs., or rather less, between 9¾ and 10. In July, the yield is rather less, on account of the heat. August again takes a little more to the pound ; it is the worst month, at least the 3 first weeks are bad ; that is, the last fortnight of July and the first fortnight of August, are the worst of the year, on account of the heat. In September, the quantity varies from 9 to 9¼ lbs ; in October,, between 8 and 9 lbs. That depends a good deal on the firmness of the cheese.

M. Tache.—I have often received complaints from people who have given up the old way of making cheese in favour of the new : they say that it takes more milk to make a pound of cheese now than it did on the old plan. After consulting Mr. MacPherson, whose plan we have adopted we have invariably replied, that it is better to lose a little of the yield of the milk, and to make a finer quality of cheese. When you take more pounds of milk to make a pound of cheese, your whey is no richer than before ; there is more of it, but it is no richer. If you retain some of the whey in the cheese, it will be of inferior quality. The cheese loses less weight in keeping, when it is made from a larger quantity of milk to the pound ; it is freer of moisture, it deteriorates less rapidly. There are an infinity of reasons why it should be better.

Report of M. Marsan's Factory.

May	9	87/000	lbs.
June 1st to 14th	10	1/6	"
June 14th to July 15th	10	3/10	"
July 15th to 31st	10	48/100	"
August	10		
September	9	7/10	
October	8⅛ to 8½		

This report is made in accordance with the formula we have adopted.

M. L'Abbe Gerin.—In considering this question, I think we must pay great attention to the breed of the cattle. I read, yesterday, two reports, one from the North and the other from the Eastern-Townships ; the difference between them was pretty considerable. Upon enquiry, I found that

the former, which gave yields certainly superior to the other, came from a factory, the patrons of which keep hardly any but Canadian cows; while the other factory was supplied with the milk of Shorthorns. The former of these reports came from St. Justin, the other from Baie du Febvre. I make this remark for the purpose of giving additional encouragement to the Canadian cow, whose praises you heard sung this morning.

M. TACHE.—I remember that, two years ago, Mr. Chapais published, in Le Journal d'Agriculture, the averages taken at St-Denis (*en bas*) from one end of the season to the other: from 9¼ to 9½. At St-Hyacinthe, where the Cheddar-process is followed in all its rigour, they hardly get 9½. Will Mr. Archambault tell us what the average is?

M. J. M. ARCHAMBAULT.—9½

M. TACHE.—There is still a difference of half-a-pound, for it is nearer 9¾ than 9¼. This depends upon the Canadian blood having been preserved in greater purity in the district of St-Hyacinthe than in the district of Quebec.

M. L'ABBÉ MONTMINY.—Mr. Macdonald's report raises a question in theology, and I would not let the occasion pass without a word in answer. I feel it would not be difficult to answer it in a way acceptable to all people: our farmers love their wives and children, they therefore take a little holiday once a week to make butter for their family. I do not think it is absolutely necessary to work on Sunday, when, by making this little sacrifice, a pleasure is conferred on the wife and children, and at the same time, means are provided for buying and paying for those trifling adornments, which otherwise would have to be bought on credit at the store, and would eventually cost the purse-filler much dearer.

I would draw your attention to the words of Mr. Macdonald on the care to be bestowed on the milk. From what I see, the whole secret of cheese-making lies in this. If every one were honest, truly honest, anxious to do things properly, most carefully would the milk be attended to.

In some places, there are people who are really anxious to make the best cheese possible, and, with that view, some parishes without much means indulge in the luxury of engaging a maker at very high wages. This maker, desirous of maintaining his reputation, is very strict about the milk delivered at his factory. He refuses pitilessly all the milk that has not been properly cared for at the farm, and sometimes refuses as many as two or three milkings on the Monday morning.

But it is those who are ambitious of improving their ways who suffer the greatest trouble. They have to contend with men who come boasting that at their factory so much care is not needed, that they make the cheese

cheaper, and get more out of 100 lbs. of milk ; that there is no need to cool the milk at home ; it will cool well enough in the vats; on Monday, they say, they accept even the third and fourth last milkings.

These are some of the troubles they have to go through who desire to show their good intentions towards their employers.

It is the duty of the inspectors, by their praiseworthy efforts, to make farmers understand these things ; to compel them to be sincere and to tell the truth. The dealers in cheese, too, must help us, by speaking frankly ; when they pay eight cents a pound for cheese, let them say eight, and not pretend that they paid nine. I accuse nobody ; but I contend that we must be united, and work together to maintain our reputation ; you saw in the last reports, published in the papers, that we had sold less cheese than the United States, but that we had received more money for ours, because it was good.

We must concentrate all our efforts to maintain our reputation abroad as makers of cheese. And, so, let us all take pains, let there be none of those petty rivalries Mr Macdonald mentioned, and we shall be in a position to congratulate ourselves on the results.

M. TACHE.—The Association distributes to all the factory-owners printed circulars describing the care to be taken of the milk. This is what the circular says on the subject M. Montminy has been talking about: 1. it recommends the observance of the greatest cleanliness from one end to the other of the different operations. During the milking, as soon as a pail is filled, it is to be strained at once, either into another pail, or into the cans, or vessels, where it should be cooled and aerated.

It adds, and this is corroborated by our inspectors: "We must be allowed to add, basing our assertion on our own experience, that to believe that milk should not be strained, is a prejudice, a most injurious error."

Now-a-days, it is recommended to aerate the milk as soon as it is strained. Mr Robertson says: "The milk having been drawn from the cow, and the vessel being well cleaned, as generally is the case since the women have begun to take care of them, the milk should be strained at once, and the greatest care should be taken in doing so! We are even advised not to use vessels that have a fixed metallic strainer, because it always retains the germs of filth. A strainer of linen is better than a metallic one.

M. J. ALLARD.—The misfortune is, that when we distribute these books, or circulars, the patrons are so mortified that they take the offer of one as an insult.

M. TACHE.—If you do not like to undertake the responsibility of distri-

buting them, you have only to send me the address of your patrons: we will send them copies, in the Association's name, and, in that case, you will incur no responsibility.

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THE DAIRY-INDUSTRY. (1)

REVIEW OF FOREIGN WORKS ON THE SUBJECT,

PREPARED BY M. J. C. CHAPAIS FOR THE ARTHABASKA MEETING OF THE DAIRYMEN'S ASSOCIATION, DECEMBER, 1889.

Tradition, memory, and writings are the sources whence man must draw information when he wishes to acquire knowledge. Were he left to himself, he would find it impossible to overstep the limited circle of ideas acquired by his own experience. This circle would be more or less extensive in proportion as his intelligence was more or less great, but, after all, his knowledge would always remain in a rudimentary state. To advance a step in the road, the knowledge acquired by others must be made our own, and that by tradition and memory for that which concerns the the departed, and by their writings as regards those of our cotemporaries whom we cannot hope to see or hear.

This is true of all the sciences, all the arts, and all the trades. Without this, each generation, and every individual of each generation, would be obliged to make a fresh start in the path of study, of research, and even in his practice. We who are specially busy with the dairy-industry must, like all the world, look around us, inquire, profit by the experience of others, and not trust to our own, if we desire to make progress in our business. It is for that reason that I come before you to-day, gentlemen, to occupy your attention for a few minutes with the labours performed by our sister-associationsof the province of Ontario, which began the work of the dairy long before we did, and which, in consequence, are much further advanced in it than we are. In order that this enquiry may be the more fruitful, I have only extended it to the two last reports, containing a description of the labours of these associations, that, in the first place, I may not detain you too long, and, next, that you may have an opportunity of hearing the last gained results of their investigations and experience.

On opening these reports, I saw at once that the work of the dairymen's associations of Ontario is formed after a programme very nearly the same as that we follow at our meetings.

Our brethren in Ontario, knowing that to make cheese and butter we must first of all make sure of the raw material, milk, and to have this cows must

(1) N. B.—All the lectures that follow were left on the table for want of time ; consequently, they must not be taken as having passed thorough the crucible of discussion.—THE SECRETARY.

be kept and properly fed, conceived that it was of importance for them to study all questions that relate to agriculture in its connection with the dairy. Here are some of the chief points of their programme :

1. The enriching of the soil to cause it to produce the food necessary for cattle kept for the purposes of the dairy.

2. The most rational way of utilizing the said food by means of the cattle.

3. The rearing of cattle for the dairy, and the method of feeding them so as to get the greatest profit from them.

4. The investigation of milk, of its composition, preservation, of its greater or less value in proportion to its richness.

5. The making of butter.

6. The making of cheese.

7. The sale of dairy-products.

8. The utilization of the waste products of milk.

9. The means of developing and improving the progress of the dairy-industry.

As you see, gentlemen, the programme is extensive. But, extensive as it is, our sister associations of Ontario, if they have not exhausted it—which is an impossibility—have nevertheless scrutinized it from every point of view, and from it have drawn, as I hope to show you in some short extracts from their reports, experience and conclusions of the greatest value.

I

THE FERTILIZATION OF THE SOIL TO CAUSE THE PRODUCTION OF THE FOOD NECESSARY FOR CATTLE KEPT FOR DAIRY-PURPOSES.

The word fertilization does not necessarily convey the idea of using dung, which, on the farm, is the first source of fertility. The first idea of this precious substance that I find in the reports is that given by Professor Hoard, Governor of the State of Wisconsin, and one of the most notable experts in all that regards the subject we are concerned with. He gives the following recipe for fixing the ammonia in the dung : He had in his stalls, a good number of cattle, which were rather cramped for room. The air was vitiated by the ammonia that escaped from their droppings. He ordered a little plaster to be thrown, every morning, in the passages of the cowhouses where the dung fell. The smell disappeared at once : a clear proof that the ammonia was no longer disengaged. Result : good air in the cowhouse, and a richer dung. (Rep. 87, p. 66).

The same Mr. Hoard pointed out, as a means, if not of enriching the soil, at least of making it yield up its fertilizing elements, the pulverizing of the soil by frequent harrowings, even, in the case of corn, for example, when it is 4 inches high. (Idem p. 66).

Further, another eminent professor, whose name is farmiliar to more than one of us, Professor Roberts, of Cornell University, lays down thus the question of the fertilization of the soil: We begin with cultivation, good ploughing, plenty of harrowing; and he then recommends sowing clover, which will bring up from far below the surface the elements of fertility, and be afterwards given to the stock which will in return give us rich manure. According to the professor, half the value of the food is found in the dung. This idea of Professor Roberstson's is evidently not entirely developed, for as I have stated it to you there would only be a part of the elements taken from the soil restored to it. Therefore, he says, further on. that the cattle should be fed on extra food, such as bran, cotton-seed meal, &c. These, with the plaster added to the dung by Mr. Hoard, regulate the question of the complete restitution to the soil of all the fertilizing matters cultivation extracts from it.

It is not sufficient, says the same professor elsewhere, that the soil be enriched; but, to get it to yield up its fertilizing elements, those plants that are suited to the soil must be grown. We do not grow celery on a sand-bank, neither does the walnut bear well except in a rich alluvial soil. (Rep. 88, p. 24.)

And, now, before quitting the subject of the fertilizing of the soil for the purpose of getting the food of stock from it, I will close by quoting a few of Professor Robertson's remarks, at Guelph College, Ontario, showing what the soil can be made to yield with proper treatment. They read as follows: With only 20 acres of very ordinary pasture, all that was needed as extra food by 20 cows, during the summer, and up to October 20th, was a half acre of green-meat composed of pease and oats, and ½ of an acre of Southern mammoth sweet corn, with, in addition, a little bran every day. (Rep. of Prof. Robertson, 88, p. 12.)

Judging from these extracts, this division of the programme may be stated briefly as follows: perfect cultivation and pulverization; the application of well managed dung, added to some artificial food or manure, in sufficient quantities to restore to the land what the previous crops have taken from it; and, lastly, the sowing of such crops alone as are perfectly adapted to the character of the soil.

II.

THE MOST RATIONAL MODE OF USING THE FOOD, THUS OBTAINED, FOR THE FEEDING OF CATTLE.

The above is the second point we have to consider. Let us state, first, that the greater number of the lecturers whose ideas we are studying, are in favour of ensilage as the best mode of preparing cattle-food under the form of forage. In this, Messrs. Robertson, Roberts, Hoard, and Gould agree. They all say that maize, cut when the ear is glazed, is the best stuff for the silo. But that need not hinder, in the Eastern part of the province, the farmer who cannot grow maize there, from filling his silo, though not so profitably, with clover, tares, &c.

I pass over the details of the construction of siloes, for this very good reason: we are as far advanced in this matter as our Ontario friends. I will limit myself to giving an excellent definition, by Professor Robertson, of the terms connected with the silo:

"A *silo*," say he, "is simply a place where green-meat, with all its juices in it, is preserved from contact with the air. It may be an excavation, a box, a place in the barn, a reservoir, a building, or a trench in the ground. *Silage* is the term employed to designate the green-meat preserved in the silo. *Ensilage* is the name applied to the whole system. To *ensile* is the verb employed to express the action of filling the silo. *Ensiler* is the person who makes use of a *silo* to *ensile* in it green-meat for the purpose of making *silage* of it by the process of *ensilage*. (Rep. Prof. Robertson, 88, p. 7).

The silage ought not to be given to cattle alone. If nothing else were given them, they would require from 50 lbs. to 60 lbs. a head each day. It is better to give them 25 or 35 lbs. a day with other food. The silage weighs, from 40 to 50 lbs. per cubic foot, according to its compressed state. In Ontario, they harvest from 15 to 25 tons of corn for ensilage to the acre. For ten milch cows' food during six months, a good ration is: 3 lbs. of bran, 5 lbs. of ground mixed grain—oats, barley, pease—5 lbs. of hay, or straw *ad lib.*, and 30 lbs. of silage a day; and to supply this only an acre and a-half of maize will be required, and a silo of 12 feet cube will hold the crop. (Rep. of Prof. Robertson, 88, pp. 8 and 9).

Here follow some axioms from the same report: Ensilage corn cultivated almost to ripeness in rows or hills, sufficiently far apart to allow free entrance to the light, supplies an economical food for both winter and summer. The system of ensilage is the cheapest way of preserving in a crop of green-meat its full nutritive value for cattle and pigs. A little salt should be given to cows every day. If they have it not, their milk suffers in both quantity and quality. It pays to give them bran, pease, barley, linseed

oilcake, cotton seed meal, and all things rich in albuminoids, with their ration of silage. It does not pay to give them green corn, when we can give it them in a nearly ripe state. (Rep. Prof. R. 88, p. 12).

III.

ON REARING CATTLE FOR DAIRY PURPOSES, AND THE WAY OF FEEDING THEM IN THE MOST PROFITABLE MANNER.

The first step in rearing cattle is the selection of the breed. Mr Derbyshire gives his opinion, but his ideas are rather old-fashioned. For milk intended for cheese-making, he would cross his best milch-cows with a Dutch bull ; but, for butter, he would select a Jersey bull.

When the calf is born, Messrs. Derbyshire, Robertson, Cheesman, Moyer, and Fuller, agree that it can be well reared on sweet skim milk, given at a temperature of 96° F. Diarrhea is most frequently caused, in calves, by giving them cold milk. (Rep. 87, pp. 14 and 15).

Mr Henry Groff recommends, in addition, that the calf be always kept well and plentifully fed, in a clean and well ventilated stable, kindly treated, and kept clean. He would curry and brush it twice a week in winter (Id., p. 13). So much for the calves.

The farmer, whether he rears his own calves or buys milch-cows for his dairy, must know how to choose them, and Mr. Hoard asserts, and with reason, that, in selecting them, there is a question to be studied—that of heredity. Generally, in order that a cow may turn out a good milker, she must not only belong to a milking breed, but also to a milking strain, both on the mother's and the sire's side.

I shall not return to the subject of the food necessary to make cows yield the greatest quantity of milk, but I see before me here a plea of Prof. Robertson in favour of making cows calve in autumn, as a means of getting the greatest profit out of them. Here it is : 1. A cow that calves between September and November, has a longer milking season ; 2. Better and less costly calves are produced, whether for the butcher or for the dairy ; 3. Butter is 50o/o dearer from November to April, than from April to November ; 4. By this system, remumerative employment can be given to the labourers on the farm throughout the year ; 5. The carriage of goods for exportation incurs no risk. (R. Prof. Robertson, 87, p. 66).

We will conclude this part of our subject with the following advice given by Mr. Hoard, on keeping cows clean in their stable in winter. At the end of the cow's stall is nailed, to the floor, a bar of wood from two to two and a-half inches thick. This bar is placed immediately in the rear of the recumbent cow. The manger juts out very prominently in its upper

part, so that when the cow rises, she is obliged to retreat one or two feet, hence, the litter is kept within the stall, and the droppings fall beyond the bar. Thus the cows is kept clean and comfortable all through the winter. (Rep. 87, p. 66).

IV.

ON THE SUBJECT OF MILK ; ITS COMPOSITION, ITS PRESERVATION, ITS VALUE, MORE OR LESS, ACCORDING TO ITS RICHNESS.

On this subject, Prof. Robertson begins by telling us a most valuable truth : " To produce milk of the best quality, the farm must be fertile and full of growth. We might just as well expect to find a well flavoured apple on a tree half dead, and infested with insects, or a good bullock in an animal fed on rotten straw, as to try to get milk of the best quality from cows reared on half-rations. (Rep. 37, p. 57).

But a cow may have been properly reared, and still give inferior milk, or, at least, milk not of the best quality ; and the Professor next points to the reasons : The state of the blood, and of the nervous system of the cow, exercises great influence on the quality of her milk. Bad keep, dirty water, the absence of salt in her food, place the cow in such a condition that she cannot give good milk, and this condition may also proceed from negligence, semi-starvation, excitement, and rough treatment (Rep. 28, p. 144). To point out the causes of the production of bad milk, is to point out at the same time the way to obviate them. It must not be forgotten that these causes not only affect the smell and the quality of the milk, but its value as well, for, as Mr. Robertson says, excitement not only diminishes the quantity of the milk, but still more reduces the quantity of butter-fat in it. (Id. Id.). Hence, to secure good rich milk, that will keep well, good rearing, good food, good care, and proper management are necessary.

V.

ON THE MANUFACTURE OF BUTTER.

To enter upon this subject properly, we must begin by saying that to make good butter good milk is needed. We have just seen how the farmer can make sure of having it good. But though it may be good as long as it remains at the farm, it by no means follows that it shall be good when it reaches the creamery. There are roads and springs between the patron's house and the factory ; the milk when it reaches the latter place may be stale, badly aerated, or watered, and all these affect both the quality and the quantity of the butter ; and it is for this reason that, in the reports we are examining, the assay or proof of the milk on its arrival at the factory

is discussed. Allow me to say that this assay should be made in the cheeseries as well as in the creameries.

Mr Roddick, of Lancaster, tells us that to make the assay of milk, we must first provide a lactometer, a thermometer, a creamometer, and cream-gauges (*éprouvettes ou tubes d'essai*) or tubes. Milk that contains less cream than usual may owe this to two causes: it has either been watered, or skimmed. If it has been skimmed, it will weigh more than milk in its natural state; it will weigh more, if it has been watered. Milk may not throw up its cream if it be sour. Mr Roddick does not think the lactoscope a good instrument for discovering the adulteration of milk. (Rep. 87, pp. 93, 94.)

Mr W. A. Macdonald, of London, Ontario, after mentioning the apparatus named by Mr. Roddick, points out another, the lactobutyrometer, which, in his opinion, is still more correct. In fact, Mr Macdonald seems to have but little faith in the proofs by the lactometer and the creamometer; and he asserts that most of the lactometers he has seen at creameries and cheeseries are not trustworthy. Mr Derbyshire thinks that, in most cases, the results arrived at by the testing of the milk with the lactometer and creamometer are to be relied upon. (Rep. 87, pp. 105, 100.)

One question presents itself immediately after that of having good milk: what is the best way of getting the cream from the milk? The different ways of doing this are too well known to you for it to be necessary to enlarge on them. Only, it will interest you to know the opinions of two experts as to which they think the best plan. Messrs, R. Graham, of Belleville, and Robertson, agree on this point, and here is an abridgment of their opinion: Prof. Robertson shows that, among ordinary farmers who set their milk in deep cans, it takes 33 lbs. of milk to make a pound of butter. With those who set for 12 or 24 hours in iced water, 28 lbs. are sufficient. With the centrifugal separator 21 lbs. of the same milk will make a pound of butter. In the first instance, we have 3.03 lbs. of butter from 100 lbs. of milk; in the second, 3.57 lbs; in the third, 3.85. With iced-water, an increase is made of 17.8o/o; with the separator, 22o/o, over the common system, and, with the latter implement, a gain of 7.8o/o is made over the iced-water plan. The far higher profit made by the use of the separator must cause its adoption everywhere when the necessity of carrying all the milk to the factory does not occasion enough expense to destroy the profit made by the surplus of butter obtained by the use of the separator. (Rep. of Prof. Robertson, 88, pp. 3, 4. Rep. 87, pp. 34, 35).

As to the manufacture of butter itself, I shall only stop to explain the difficulty sometimes encountered in getting butter to *come*, when the cream is in a peculiar condition, and to speak of the part played by salt in the

making up of butter. And first : why does not butter *come* as easily at one churning as at another ? Let Prof. Robertson tell us : The globules of butter have no skin, no pellicle around them, as was believed to be the case for a long time. They resemble drops of water, or quicksilver, thrown on a marble slab. But it sometimes happens in winter that the part of the milk called *casein*, the *albumen*, and a slight quantity of the *fibrin*, gather together round the globules, attach themselves to them and sometimes concentrate themselves in such a fashion that they surround the globule with a species, so to speak, of gum, and keep it, by their weight, at the bottom. That is the reason why the cream does not rise, the butter does not come. Mix two quarts of water with a pailful of milk or cream in such cases, and the cream will rise and the butter come, because the water added will wash off the gum from the globules, and that it was that prevented the cream from rising. You will succeed still better by developing a certain degree of acidity in your cream. If you churn your cream sweet, you will get 72o/o, of the butter it contains ; churn it sour, and you will get 97o/o. Churn it mixed, sweet and sour together, the sour will yield its butter quicker, and seeing that a certain quantity of butter has come, you will stop the churn before the sweet cream has yielded its butter, which will be lost, and go into the pig's pail. Mix the cream to be churned 20 hours before-hand, if you wish to avoid this loss. Temperature, too, has an important part to play in this. Churn cream at 57° to 59° in summer, at 62° to 66° in winter. If it is too cold, the globules will be too hard and won't coalesce. If the butter, then, is loth to come, begin by diluting the cream, to deprive it of its too great viscidity ; then, sour it still more, destroying the viscidity, and lastly, churn it at the right temperature. (Rep. Prof Robertson, 88 pp. 45, 46, 47).

As to the question of salt, here is the report of a committee appointed to examine the samples prepared in a test of butter-salt made at the creamery attached to Guelph College. As to quality, Canadian salt caused a diminution of weight by the addition of the salt and the working of the butter ; English salt had the advantage in a slight degree. The committee advised :

1. The use of pure, clean salt, with grains as equal as possible in size ; it should be dissolved quickly and entirely before the second working of the butter ;

2. The use of parchment paper on the second layer of salt at the top of the tub, between that layer and the cover ;

3. The repeated soaking of the tubs in brine to replace the humidity evaporated ;

4. The maintenance of an invariable temperature in the butter-store. (Rep. 87, p. 33.)

Before we begin to attack the question of the manufacture of cheese, it may be I shall be asked: which pays the better, cheese or butter? To this Mr Robertson replies: I do not advise butter-making in summer, in competition with cheese-factories. Where they have been tried in this way they have failed. And this arises from certain circumstances. We ought not to try to supply other markets than our own local ones in summer. During that season, we cannot successfully compete with the English, French, and Swedish farmers on the European markets. The difficulty of transporting, in summer, delicate butters to the distant cities of England is almost insurmountable. In winter this difficulty exists no longer. Our true butter-making season extends from November to April, and the building that has served for a cheesery in summer, may be used as a creamery in winter. To make this change, would not cost more than about $200 for the milk of 500 cows. The general use of silage would afford succulent food, and would enable us to make perhaps double the profit we could gain from summer butter-making. (Rep. Prof. Robertson, 88, p. 5).

VI.

ON THE MANUFACTURE OF CHEESE.

While reading these reports, two points struck me. Mr John Robertson, of London, has thus developed them: A great deal of cheese is without flavour; it is not bad, does not look bad, but it is insipid. This defect he attributes to the curd not having been uniformly cut (*or ground?* trans..) Pieces of the curd have been left too large, and have retained the whey, and it is whey that has prevented the flavour from developing. He complains, too, that the cheese has no consistency, and works so much in the drying-room that, if the weather is warm, it bursts. This he attributes to the drawing off of the whey when it is very acid It should be drawn off, he says, when on the point of becoming acid, and, according to him, there is but one rule to find the proper moment; practice alone will teach the maker to take the right instant, which never varies. (Rep. 87, pp. 74, 75).

Mr. Derbyshire, for his part, relates that the cheese-factories are so badly built that the temperature cannot be regulated, and attributes the bad cheese made principally to this cause. He says that above all the drying-room must be perfectly staunch, so that it can be kept at any desired temperature.

Lastly, Mr. George Alexander, of Watford, read a letter from England, in which a buyer of cheese told him that a bad box made a cheese, otherwise of good quality, sell for two or three shillings less a cwt. This is worthy of notice. Rep. 88, p. 120).

VII.

ON THE SALE OF DAIRY-PRODUCTS.

Complaints are sometimes made that we have no market for our butter. To this Prof. Robertson replies that to have one, we must endeavour to develop the wants of the local markets of our towns. Scores of families are ready to pay remunerative prices for a regular provision of good butter. A good local market would be more constantly profitable to a butter-maker than a foreign market. The best quality of butter will always command an extra price, and the demand for it will be unlimited (Rep. 87, p. 16).

Mr. Thomas Johnson, a dealer in butter at Toronto, thinks that, as soon as butter is ready for the market, it should be sold. If it is good and well made, then, it will always fetch a good price for exportation, if it can be sent in refrigerators. Butter made before June should never be exported. Butter made in June, July, and August, should never be kept. He is opposed to the speculative idea of keeping butter with a view to getting a higher price. However high the price may be, the butter will always have lost in weight and in flavour. September and October butters alone can be kept without risk, and he does not much care to advise keeping even them. (Rep. 77, p. 20).

As to the market for cheese, Mr. Derbyshire says that if we have no local market, it is because all the good cheese is sent elsewhere, and nothing but the inferior qualities are sent to the local market. He complains that there are too many badly managed factories. Prof. Roberstson blames speculators who, having been offered a fair price, will not accept it, and keep back their cheese. He says that even if they succeed later on in getting a little higher price, they finish by losing money. Prof. Hoard declares that the difficulty in finding a good regular market lies in the fact of half the factory-cheese being badly made. Mr. Caswell, of Ingersoll, thinks it is of importance to sell the cheese as soon as it is fit for the market. (Rep. 87, pp. 148, 249).

VIII.

THE UTILIZATION OF THE WASTE PRODUCTS OF MILK.

Prof. Robertson thinks that the pig is the right animal to consume profitably the whey and butter-milk. Whey contains 92o/o of water; 0.92o/o of of nitrogenous substances; 0.32o/o of fat; 4.65 of milk-sugar; 0.35o/o of lactic acid; 0.75o/o of potash. These elements ought to produce 2 lbs. of pork for each 100 lbs. of whey. They must, of course, be combined with ground pease, wheat, pollards or bran. Whey must not be allowed to become sour. Green-meat, such as clover, maize, &c., should also be given to the pigs.

Butter-milk, with grain &c., as above, will produce 2½ times as much pork as whey.

Mr John Fulton, of Brownsville, keeps 40 cows, and with the refuse of the milk of these 40 cows, he feeds 20 pigs of 200 lbs. each, and in that way makes $5 profit per cow in pork. (Rep. 88, pp. 18, 19, 112, 113).

IX.

ON THE MEANS OF DEVELOPING AND CAUSING THE PROSPERITY OF THE DAIRY-INDUSTRY

More than half the cows of the province furnish no milk to the factories. They should be made to do so. Twice as much milk and butter might be got from the cows as they yield at present. Make them give it. The same number of acres would keep double the number of cows that they now do. Let this be amended. Such is the opinion of Professor Robertson. (Rep. 87, p. 15).

Later on, he adds, as means of improvement: 1. The appointment of professors and inspectors; 2. The publication of bulletins by the dairy-department of the agricultural college; 3. The establishment of refrigerators for the preservation of dairy-products; 4. The production of milk in winter; 5. Annual meetings of the factory-patrons for the discussion of their interests. (Id. p. 17).

Mr Vallancey Fuller suggests the following means: 1. An improved knowledge of the processes of manufacture and of marketing the goods; 2. An increased production of milk; 3. Better and more rational feeding of milch-cows; 4. Breeding cows from bulls belonging especially to the milk-breeds. (Rep. 87, p. 24).

Mr. Derbyshire says that if good results are desired in the future, speculation must cease. He condemns the purchase of cheese by contract, and wishes the syndicates to sell in proportion as the cheese is ready. (Id., p. 50).

A committee appointed to study the means of disseminating the information connected with the dairy-business recommends: 1. That meetings be held at different places at fixed dates; 2. That the number of instructors and inspectors be increased; 3. That the factory proprietors be persuaded to subscribe for the payment of a greater number of instructors; 4. To cause three visits to be made by the instructor to each proprietor who has thus subscribed; 5. To encourage meetings of the patrons for the discussion of questions that concern their interests. (Id., p. 84).

Although, gentlemen, I have tried to be concise, I fear I have not succeeded as well as I could wish. And more: many of you are no doubt thinking to themselves that I have not told you anything very new. I admit it.

But how many things do we know and never put in practice? Well! it is for this reason that it is good to have compressed into a sort of condensed catechism all the general principles by which the dairy-business is governed, so as to be in position to consult it when necessary. In this way, the rules are not so easily forgotten. It is on that account that I was induced to lay this before you.

J. C. CHAPAIS.

THE HOG.

BY M. ANTOINE CASAVANT,

Mr. President and Gentlemen,

I have been requested by the secretary, not to deliver a lecture to the meeting, but to say a few words on this subject. I cannot, I think, choose a better one than that which formed the object of my lecture last year.

I shall therefore keep within the limits of a few complementary explanations on the choice of breeds, on rearing and fattenings pigs as connected with the dairy-industry.

At our last meeting, several members asked me questions relating to the rearing and fattening of pigs. It is to these questions that I could not then answer in full that I propose to reply to-day.

1st.—OF THE CHOICE OF BREEDS.

Many years ago, I was convinced that the hogs kept in most of our country places were of a very inferior breed. Still, they are, it is true, generally, the offspring of crossings of the improved breeds; but careless treatment and a defective or badly understood system of feeding have led to their degeneration.

In my opinion, the best breed is the *Chester-White* It is precocious. With proper treatment, pigs of 5 or 6 months old may be made fit for the butcher, and at that age, their pork is very good indeed.

If it is desired to carry the fattening on further, they can be made to weigh 400 lbs. and upwards.

Last year, 11 porkers of this breed, farrowed Sept. 20th (the sow was at that date 4 and the boar 3 years old), were sold in Febuary, March, and April, and yielded 2,026 lbs. of meat. These pigs, sold alive, at $9.50 the cental, returned me $192.47; that is, I got back all the cost of rearing and fattening with a good profit besides: that is the advantage of having a good breed, precocious, and that will weigh well.

Were I not afraid of tiring you, I could give you many more instances of the value of this breed.

To sum up: I have had much experience in the different breeds, such as the Yorkshires, Suffolks, Berkshires, as well as our own country pigs, &c., a good number of which I have bought for the needs of my piggery, but they have never paid me very well. Now, after many trials, I do not hesitate to give my preference to the *Chester-White*. and I recommend it to all who are desirous of getting tendency to early fattening, with at the same time a remunerative weight and a good quality of meat.

2. OF SELECTING BREEDING PIGS.

For breeding purposes the sow should be lengthy, the head fine, brisket full, legs fine, hind-quarters fleshy, and the teats numerous.

The boar should be of the same shape as the sow, except that his body should be shorter. He should be kept alone in a sty, and fed on dry grain, oats and other grain mixed, to preserve his vigour.

If the sows produce good litters, they should be kept as long as possible. Two litters a year may be taken from each, without wearing them out, and that for 4 or 5 years.

When a change of boar is desirable, he should be got from another breeder, but of the same race. This advice I give from experience; I by no means intend laying down a rule, but this is the result I have obtained, and, hoping that it may be useful to some of you, I simply relate it: I have often been disappointed by taking the boar from the same family, that is, by mating brother and sister. I don't try to account for the failure; I repeat, that it is a fact; I have proved it, that's all.

Brood-sows ought to be in a place where they can take exercise, so as to preserve their health. A sow ought not to farrow before she is 12 months old.

Sows ought never to be fed on raw meat, lest the taste of it induce them to eat their young. They must be watched when they are about to pig; what little straw they have should be short: and the pigs should be kept in a warm place and not separated from the sow. As soon as the little ones begin to take food, a division must be made in the sty, the two parts of the sty communicating with each other by an opening large enough to let the pigs pass, but impervious to the sow.

Then, their food must be milk given in a trough, which must have as many compartments as there are pigs, and be so made that they can neither fight with each other, nor get into the trough. Some meal may be added to the milk: barley, oat, or rye-meal. After weaning, at, say, from 4 to 6 weeks old, everything should be tried to develop the frame and muscle of

the young pigs. For this purpose, I use the above meals, mixed with milk, which is indispensable, and when green-meat or vegetables can be added, the diet is perfect.

Of all green-crops clover is the best for pigs, especially *alsike*. The green-meat may be cut when 8 or 10 inches high and given in abundance. This food may be given both to young pigs and those fattening, and well into the autumn, as several cuttings may be taken from the same field. Lucerne is very good for pigs: three or four crops of this can be cut if the land be suited to the plant. It deserves more attention that it has hitherto had, as it is the earliest of all green-crops.

Green-corn is also an excellent food for pigs; it fills up the interval between the failure of the clovers and the maturity of the root-crop. All pigs, whether young or fattening, are greedy after it. This year, for 5 weeks, I fed all my pigs with corn such as we grow for the cows at pasture, but the rows nearer together than for silage-corn; the stalks were, consequently, rather finer. I kept them on this until the mangels were ready. I, after that, fed on yellow-globe mangels and sugar-beets, boiled and mixed with corn and barley crushed together in the proportion of 6 bushels of grain to 9 of beets.

The older pigs, fattening, get additional raw grain, such as corn and pease.

It is not necessary to say that the pigs that are on green-meat get a portion of barley meal, mixed with water at least 12 hours beforehand. I prefer giving them barley in summer, because when prepared thus in advance it acquires a slightly acid taste that excites the appetites of the pigs, a result not to be obtained with corn.

I prefer crushed grain for boiling with roots. Those who grow no roots, can, in winter, use, for the young pigs, chaffed clover cooked or boiled with meal. But you must understand that the clover must have been made and carried in perfect condition. All the refuse of the garden and kitchen should be sent to the piggery for food. The advantages derived from the use of green-meat are:

1. Green-meat contains all the elements necessary for the development of the frame and muscles;

2. It is very economical.

3. The meal given to the pigs after their ration of green-meat, though in small quantities, is more efficacious. They take more time to eat it, and, in consequence, digest it better; thus, all the nutritive matters are utilized.

Speaking of food, I have several times proved that vegetables are indis-

pensable to a rapid and paying system of fattening. Moreover, the leaves of carrots and mangels are also very useful. Thus, the leaves of the beets and carrots grown for the piggery have, alone, brought me in a good profit ; as thus : On the 15th September, my cows were already in their stalls, and were getting a ration of hay, though there was plenty of grass left. At this period, I began to pull the mangels for the pigs ; the leaves were cut, put in heaps, and given to the cows in the cowhouse, a few at a time, morning and evening. This increased the yield of milk by 4 lbs. a day, and this increase continued without diminution up to the beginning of November. I calculate that the mangel-leaves brought me in $10 or $11 an acre ; more than enough to pay the for whole of the manual labour expended on the crop.

But what shall we say about that mass of manure manufactured during the year? I say manufactured, because we mix up the refuse of the garden, all the inferior fodder, and leaves, used for litter when we can easily get them, horse-dung, together with a lot of dry earth, such as fine *terre-jaune*, or loam, *terre de foncière*, that is the remains of vegetation, and all other sorts of earth.

I only note this passingly, having no intention of detaining you on this subject.

In conclusion, gentlemen, I do not think it will be necessary to insist again on the advantages the dairy-industry would derive from the breeding of pigs as I have described it, and, at the same time, on the benefits the breeding of pigs would derive from being in close juxta-position to a dairy.

Both these industries are so closely allied that to impart an impulse to the one cannot fail to cause the progress of the other.

ANTOINE CASAVANT.

St-Dominique de Bagot, December, 1889.

THE MANUFACTURE OF BUTTER.

By Charles Préfontaine.

Here, in a few words, are the principal questions I should like to discuss with my fellow-workmen who are present at this meeting.

In the first place, touching the making of butter, I must tell you that the system pursued at present is recognized as the best, except that there still exist some faults in the management of some makers, of which the following are the principal :

The want of ice, of which many makers, particularly below Quebec, make no use. This is a great injury to the butter made in hot weather.

Next come the use of pails instead of vats, which ought to replace the former, for cooling the cream, a plan which all should adopt; but of which, unfortunately, a great many do not yet see the advantage.

I must add in passing, that, formerly our cream was allowed to sour for 24 hours; this year, however, we have treated it differently. Instead of after 24 hours, we do not churn till 48 hours have elapsed, and by this treatment, we find that we have less difficulty in separating the butter from the milk, and we get a much greater yield than in former years. As to the quality and the keeping of the butter, I cannot pronounce positively this year as I propose to continue my experiments next year. This season, we followed the advice of those experts of last year who found the best sample of butter to be that which had only been worked once. But I must say that our butter was not found to be as good as in former years, and I attribute this to the recent change of treatment.

Now comes the most important subject of all; one that ought to interest all butter-makers: it is the packing of the goods in the defective tubs we have used for a long time. This has been, and is the chief cause that our butter has always been depreciated on the foreign market.

Until we can succeed in getting a tub-cover that will close hermetically, we ought to employ those little casks which are made air-tight, and I am persuaded that by these means we can recover the reputation our butters were once held in. For it is clear that if our butter won't keep, the fault must be attributed to the introduction of the air through the covers of our tubs.

And in concluding that which I should have desired to explain at greater length, I may be permitted to state my own opinion as well as that of many of my brother-makers on the subject of schools for instruction in butter making: the Association seems to be too inactive in this matter.

Let us take one or two of the best creameries of the province, requesting the Government to allow them $500 a year each; a very small sum where an industry is concerned that is called upon to render such great services to the country. I am certain beforehand that no Government would refuse to grant such a sum. Or, let the office of inspector of creameries be abolished, an office which many people think is of very little use; and let the money saved be expended in fresh experiments.

We might do this: the Association could name two or three creameries of sufficient importance in the province, and each of the makers employed in them might be compelled to receive pupils gratuitously; the pupils being expected, of course, to find their own board.

The maker should be sufficiently educated to make notes of all the experiments he himself makes in his factory, and he should employ all the most modern inventions at his own cost. In a word he should use every means to make the best butter and to keep it fresh as long as possible by the different plans in vogue.

We should then have every year from each of these makers a pretty extensive report, which would be discussed at our annual meetings.

Again, we should gain by these plans much useful information acquired by our own experience, and therefore much more likely to be suited to the wants of our country.

Being obliged now-a-days to work from 3 or 4 o'clock in the morning till noon—and even then the work is often not all done,—the maker rarely has command of enough time to make experiments. For it is impossible for a man so occupied to devote the few hours of repose allowed to him to the study and acquisition of the best systems to be adopted.

Whilst with school-creameries aided by Government, the maker could the more easily devote himself to this new species of work, by availing himself of the services of one or two men who would act under his guidance.

These, gentlemen, are the principal questions that should be worked out by people more competent than I : particularly the last, which ought to have been taken into consideration long ago. For, until we make greater efforts than we are making now, most of our makers will continue to follow the old routine, and we shall soon see this, the greatest and most promising industry that ever was called upon to make our country prosperous, absolutely destroyed.

P. S.—I had two samples of butter made last year, and kept in well soldered tin boxes ; I intended to show them this year to the meeting, in order to prove whether or not it is really the air that spoils our butter.

I hope to have an opportunity at the next year's convention of showing in what condition they have kept.

Observe that this is not a speech I have prepared. These are only a few questions, taken at haphazard, which I wished to lay before the meeting of this year.

Kindly believe me to be always one of your members who will constantly work for the progress and success of the dairy-industry.

CHARLES PRÉFONTAINE,

Of the firm of PRÉFONTAINE & BROTHER.

HOW TO PREPARE STRAW FOR COWS IN WINTER.

In considering this question, I shall endeavour to keep, as far as possible, within the limits of practical management. I am well aware that a good deal of attention has been directed, chiefly in Germany and the U. S., to the question of the preparation of food for the live-stock of the farm. There have arisen chemists who pretend to give the exact food fitted to produce a milk for a given purpose, the only factor taken into account being the weight of the cow.

This phase of the feeding question is so purely ideal and so thoroughly unpractical that it is not likely to have any very long life. Feeding—like all other farming operations—depends so much on the available resources of the farm, supplemented perhaps by judicious purchases of extraneous matters, that this ideal system can hardly be carried out except by those to whom expense is no object.

But this by way of introduction. My real subject sums itself up in this: is the practice of feeding milch cows in winter on straw—a practice almost universal throughout the province—capable of any modification by which the value of that aliment can be increased without great additional outlay either in labour or in the purchase of other materials.

And first, a few words on the different sorts of straw usually found on our farms; they are oat-, wheat-, barley-, and pease-straw.

Of these, pease-straw and oat-straw are the most valuable; next comes barley-straw, and wheat-straw is, both theoretically and practically, the least valuable of all.

I need hardly pause here to remind you that the value of straw, like the value of hay, is very much modified by the state of ripeness in which the crop finds itself when it is cut, and by the weather that obtains during the time the crop lies in the field. Pease-straw, for instance, left to stand till the grain is dead-ripe, drenched with rain until the leaves are all fallen from the stalk, is very poor stuff. And so of the other straw-crops. Cut as early as possible, and carried after fine drying weather, pease-straw will be found to be, for any stock, one of the most valuable adjuncts to their food of any fodder-crop grown.

Barley-straw, when the grain is intended for the use of the brewer, and has therefore been, very properly, allowed to ripen thoroughly, is of no great value, unless, as happened this year, the constant moisture has encouraged the growth of the young clover; in which case we must of course attribute its good qualities to the latter.

Wheat-straw is very much used in the south of England for horses. It

is cut into chaff with clover-hay, in the proportion of one of straw to two of hay, but more to prevent the clover chaff from balling in the animal's stomach than from any idea of its imparting much nourishment to its frame.

In Scotland, where, owing to the dull moist climate, grain crops rarely over-ripen, horses and cattle seldom taste anything but straw as fodder, and very little hay is made; which little is kept untouched till the heavy-work of the spring begins, and is then given in by no means a lavish manner to the horses. Forty years ago, 9/10 of the noble beasts that were sent from Scotland to the London market were fattened on roots and straw alone. The straw used was almost entirely oat-straw, and the crop was, as I hinted above, generally cut on the green side.

The nutritive constituents per acre of the four kinds of straw, in a homely way of putting it, are:

	Fibre. lbs.	Starch, sugar &c. lbs.	Nitrogenous matters. lbs.	Fat. lbs.
Wheat, say, 3,000 lbs....	1,500	900	40	75
Barley, say, 2,100 lbs....	1,050	630	28	30
Oats, say, 2,700 lbs....	1,210	956	36	54
Pease, say, 2,700 lbs....	675	1,200	330	40

The above figures are from "Johnston's lectures," and have no doubt been revised over and over again since the publication of that excellent work. Here are Wolff's figures, for the same weights of straw per acre:

	Fibre. lbs.	Starch, sugar &c. lbs.	Nitrogenous matters. lbs.	Fat. lbs.
Wheat.....	1,200	900	90	36
Barley.....	840	760	73	29
Oats.....	1,080	977	108	54
Pease.....	1,016	978	175	27

It must be remembered that in these tables a good deal of the *fibre* is digestible, and part of the other elements indigestible.

A great difference indeed is visible in many places between the two sets of analyses; so great, indeed, that I am inclined to think that Johnston's figures for the nitrogenous matters of pease-straw must be a misprint. If we take the *digestible nutrients* contained in the different straws, we shall get very much nearer the proper idea of their respective values:

	Nitrogenous matters.	Starch, sugar, &c., and fibre.	Fat.
3,000 lbs.—Wheat.....	24.00	1068.00	12.00
2,100 " —Barley.....	27.00	1852.00	10.50
2,700 " —Oats.....	37.80	1081.70	16 20
2,700 " —Pease.....	78.30	901.80	12.50

I need not say that the nitrogenous matters—*albuminoids* or *protein*

compounds—are the most valuable elements of food. Taking the American valuation of the two, albuminoids and fat together, as being worth 4.33 cents, a pound and starch, sugar, digestible fibre, &c,—carbohydrates—at .9, we find that the ratio of value between wheat and pease-straw is as 37:44. Speaking as a man who in England never grew less than 12 acres of pease and horse-beans, a year, I must say that the harvesting of the pease-straw, samples of which were furnished to Mr. Stewart for the above analyses, must have been very badly managed. There is only one thing that suffers more than pease-straw from rain, and that is tare-hay. The straight upright stems of the horse-bean endure washing after being cut without much damage; I wish heavy land farmers grew more of them; there is nothing equal to this bean for horses in hard work in cold weather, and they eat the straw voraciously. What says our old English proverb of a man who is too cheeky? "We must dock his beans." The cultivation of them is simple: 2½ to 3 bushels an acre, drilled 2 feet apart and kept clean, like corn, by harrow, horse-hoe, and hand-hoe. Messrs. Irving and Drummond, of Logan's farm and Petite-Côte, grow them every year. They must be sown *very* early, and, if the land is properly worked, they are one of the best preparations for wheat or other grain.

And, now, having housed our straw, in what manner shall we prepare it for our cows in winter?

And here a question naturally arises: are the cows intended to be kept in warm quarters all the winter and soiled in summer, or to be turned out to grass as soon as the snow is off, and exposed to the cold blasts of early May? Again: are the cows kept for the purpose of supplying milk to be sold *en nature*, or to make butter? Upon the answer you make to these questions depends the point whether you shall or shall not cook their food.

In 1887, Mr. Moore, of Frome, Somersetshire. England, addressed a set of inquiries—19 in number—to 200 well known English farmers, asking them to give him their experience and practice as to (1) chaffing, (2) mixing, (3) cooking, (4) steaming, food for cattle. Of course, the English practice, universally including roots among the cattle-foods, can hardly be a guide to us, as the immense majority of our farmers, I grieve to say, grow none. Still, as in years of bad seasons, roots have to be very economically expended, straw is there largely used as a supplementary provision, and it can hardly be superfluous to mention here some of the means used to modify it in that country.

Of course all of you have a chaff-cutter of some form or another. If not, I should advise the immediate purchase of one. They are not expensive: a good hand-machine, large enough to cut up—one man to turn and a boy to feed—the day's consumption of straw for a dozen head of cow-stock

in an hour, can be had for $10 or $12. Almost all the farmers addressed by Mr. Moore cut their straw—there is hardly an exception.

The celebrated Sir John Lawes uses all his oat straw and some of his wheat-straw as food; he chaffs it all. His herd consists of 60 milch cows, which have from 4 lbs. to 7 lbs. of cotton-seed cake a day with 4 lbs. of bran, 50 lbs. of mangels, and chaff—half hay, half straw. He is not in the habit of cooking food for his stock; the Woburn experiments, which were conducted under his supervision, were against it.

Mr. Martin Sutton, the well known seedsman, uses straw largely for feeding purposes; finds great saving in chaffing it.

Mr. J. P. Sheldon, professor of dairy-teaching, at Sheen, Derbyshire, used largely oat-straw for cattle-food when on his father's farm. This gentleman, so well known from his visit to Canada, some years ago, and from his description of that country, is the only one of the 200 farmers who uses *no* litter for his cattle, horses, or pigs! He farms on the beautiful hills of "the Peak," over which I have followed the hounds many a time; the fields are large, divided by stone walls, and hardly the mark of a plough to be seen during the day. So straw must be very scarce indeed—far too scarce to be used for litter. I may say here, *par parenthèse*, that our own tenants in Glo'stershire, whose land is almost entirely in old pasture—about 40/0 arable—never litter their cows. I am sorry to add, that the yards, in consequence, are (or were) generally in a filthy state.

Mr. Sheldon "generally uses about 4 quarts of meal to each bushel of chaff. Never measures ont the food, but gives all the cows will eat up cleanly." His mixture seems to be, nearly, my own favorite one—I have often mentioned it in the *Journal of Agriculture*: pease-meal, boiled linseed, and maize, with chaff. Does not use brewers' grains, though would were he a seller of milk. Never cooks food, as damping the chaff and mixing it with the meals is quite as effective and less costly.

Mr. Richard Stratton, the well-known Shorthorn breeder, only chaffs his straw *during years of scarcity*—I am afraid our years, in this province are too generally, as regards cattle food, years of scarcity.— As to purchased foods, he has no rule, buying always what is cheapest. Finds no saving in cooking food, but, when keep is short, sometimes steams food in order to get it all consumed, and litters his cattle with *moss*.

Mr. Brockie, Caermarthenshire, tried cooking for two winters. Will not continue it, *stock did not do so well when turned out in spring.*

Mr. Duckham, the celebrated breeder of Herefords, uses all his barley- and oat-straw for food, and litters with his wheat-straw. His cows live exclusively on two feeds of "cavings" mixed with the *pomace* from cider-making, and afterwards with pulped swedes or turnips, and are supped up

with barley-or oat-straw. When short of roots, he applies *linseed*, crushed and steeped in boiling water—one peck to 20 gallons-to the cavings, letting the mixture lie and imbibe the moisture for some hours.

Next, I may mention Mr. John Speirs, a large cow-feeder of Glasgow, Scotland, who gives his *milch-cows* 8 lbs. to 10 lbs. of fresh-threshed oat-straw a day, but chaffs none. His cows get a great variety of food : "Silage (grass), oat-straw, hay, cabbages, clover, vetches, all *en nature*. Brewers and distillers grains and wash, *muttah-pease* (the *dall* of India), in meal, decorticated cotton-seed meal, refuse maize-meal from the starch-factories, linseed-cake, bean-meal, malt-cummins (rootlets of dried malt), &c. As an example of the daily food of the cow I add the following :

Oat-straw	8	lbs.
Silage (grass)	10	"
Potatoes	14	"
Grains	10	"
Linseed-cake	½	"
Muttah-pease	4	"
Refuse maize-meal	2½	"
	49	

Feeds as follows : cake during milking time, 4 A.M., grains and meals 6 A.M., 12, Noon ; and 6 P.M ; silage, mid-forenoon ; potatoes, mid-afternoon ; straw at 10 A.M., 4 P.M., and 6.15 P.M. The cows are Ayrshires, weighing about 900 lbs., so each cow eats 1/16 of her own weight, and in the course of the year upwards of 200 times as much as her own weight. Mr. Speirs should know his own business best, but I do not know what my friend Mr. Deming will say, if he sees this ! He contends that no stock should be fed oftener than twice a day ! Mr. Speirs feeds 9 times in the 24 hours and I am sure a Glasgow cow-feeder consults his own interest in the management of his stock. For the information of my "scientific ration" friends I may say that the cow-food above detailed has a nutritive ratio of 1 : 5.7.

Mr. Speirs cooks for cows only, and he is quite convinced that the greatest profit cannot be made out of a milk-business unless the cows are kept warm, and their food and drink given warm. His cows go to pasture in June and have 7 lbs. brewers' grains, 4 lbs. decorticated cotton-seed meal, 3 lbs. of oat-straw, and cut grass *ad lib.*, a day. They are *always* kept in at night, so the objection to cooked food for cows, as making them delicate when turned out in the spring, is obviated.

Mr. Hunter Pringle has a very strong feeling in favour of using straw as food for stock. He farms largely in Norfolk, and is a regular correspond-

ent of that excellent paper, the *Agricultural Gazette*. Seven shillings the arable acre he calculates to be the loss entailed throughout England by the waste of valuable feeding straw. He uses, in the form of chaff, ¾ of the straw produced on his farm, but as the Norfolk light-land farmers keep no cows, we must pass them by. Norfolk is a sheep-county, and very good mutton they make, very good beef too, but most of the bullocks are bred elsewhere.

Mr. Gilbert Murray, Derbyshire, the McPherson of the English cheese-factories, chaffs all his straw. Uses moss litter instead of wheat-straw. Finds great economy in chaffing. Feeds with oats, wheat-tailings, pease, and linseed; all ground. Steams chaff and mixes meal with it. Finds cooked food capital for dairy cows.

Now, taking a glance over the opinions of these gentlemen we find that, as regards *chaffing*, 70 per cent, adopt it entirely, 20 per cent. adopt it partially, and only 10 per cent. repudiate the practice.

As for the use of straw for litter, only Professor Sheldon and Mr. Wright use no litter at all. But then, as I observed before, the former lives in a district where very little straw is grown, and Mr. Wright is evidently in a like predicament, as he says: "I endeavour to cut a little fern for cows to calve on; at other times they have no bedding at all." Shepton Mallet, where his farm lies, is one of the richest dairy districts in England. I know it well, and can remember its extensive pastures without an acre of arable land to be seen, except on the slopes bordering on the fen.

Mr. Woods, Lord Walsingham's agent for his Norfolk property, speaks in favour of *mixed-food*; as, in fact every one of the writers does. "It prevents the food from being wasted, promotes digestion, helps the use of unpalatable food by the flavour imparted to it by the better sorts of meals, and converts poor sour edibles into wholesome nutriment."

Cooked or steamed food is evidently unpopular in England, except in the case of town-supplying dairies. One of the main reasons brought forward by the advocates of cooked food is that the process increases the digestibility of the substance treated. This, I believe to be an erroneous idea. It was shown long ago, in the case of the soldier who fortunately—fortunately for science, I mean—was wounded in such a delightfully convenient manner that the whole process of digestion could be observed throught an aperture in his chest, that boiled cabbage took 2½ hours longer to digest than uncooked cabbage. And of late years, such practical chemists as Hillriegel and Lucanus have shown that rye-straw was not increased in digestibility by fermenting or by cooking it. Experiments by Funke gave the same results regarding the digestibility of the total dry matter and the cellulose of a mixed ration given to milch-cows.

Another set of experiments, at Poppelsdorf, showed that the digestibility of hay was actually decreased by steaming. Coarse hay, given to oxen, first dry, then steamed, showed a reduced digestibility of all the constituents, but especially of the nitrogenous or protein compounds, which were reduced from 46o/o to 30o/o. Boiled bran was proved to be less digestible than uncooked bran. The deduction to be made is : the digestibility of concentrated fodder is not increased by cooking, and it is clear from what has gone before, that the general opinion of our best English farmers is not favourable to cooking food for animals where hardiness is desired ; several of the correspondents giving very decided opinions that animals that have been fed on cooked or steamed food do badly when turned out to grass in the spring.

I may as well mention, before I take my leave of this part of my subject, that the men whose opinions I have quoted above are all regular tenant farmers who, with the exception of Professor Sheldon, live entirely by farming.

And, now, having briefly considered the various modes in which straw is utilized in England for cattle-food, let us see how we, in a country far more difficult to supply with winter nutriment, can prepare this food so as to be more valuable for the production of milk than it is in its crude state.

Many of us grow pease and all of us ought to grow **flax**, unless our farms consist of land too heavy for its culture. Indian corn, too, is produced on most of our farms in the Eastern part of the province. Here, we have three most valuable grains, capable of highly useful and, at the same time, economical application to our winter dairy. For, I suppose, few farmers who are desirous of improving their methods of management will in future dry off their cows, as a rule, in November, as has been too much the practice heretofore. Scarce as good butter is at all times of the year, it is very scarce indeed in winter, and a few cows well kept would at that season add no trifling amount to the farmer's income.

For the preparation of the food, let us take, first, the case of the farm on which there is neither silage nor root-crop, and no great means of purchasing extraneous food. Some thing must be added to the straw, that is positive : let us take linseed, and proceed as follows :

Cut the straw into inch-lengths—cattle masticate long chaff better than short—spread it on a stone-floor, or on a tight wooden floor if the other is not convenient. Steep 7 lbs. of linseed in as much hot water as you can manage to prepare, and pour it over the straw, turning the stuff over and over till thoroughly mixed ; leave it to soak for ten or twelve hours, and then give it to your cows. Simple enough, but very effective, I assure you. Seven pounds of linseed will be of more use than you would believe to 10

cows. The moisture will soften the straw, the linseed will flavour it, and the two together will induce your animals to eat up their food with appetite and without waste. In a fortnight after beginning this mode of feeding, the difference in the appearance of your cows will astonish you. There is nothing like linseed for giving a satin skin to cow or horse.

But this first mode of preparing food is but a makeshift and very imperfect. The cows will not be any means digest the whole of the linseed if used uncrushed. Bite a grain of it and see how it slips from between the teeth. In England, we have small (large ones too) crushers that crack linseed at a great rate, but here we must be content with the millstones, and as the oil exuding from the seed clogs the stones we must mix some grain or pulse—or, which is better, both grain and pulse—with the linseed. You make take either :

No. 2.	1	bushel of linseed ;	}	4 bushels.
	2	" " oats ;		
	1	" " pease ;		
		or		
No. 3.	1	bushel of linseed ;	}	4½ bushels.
	2	" " oats ;		
	1½	" " corn.		

Of the two, I prefer the former, though the pure theorist would say that the *albuminoids* were very much in excess, So they are, but they are very much in defect in the straw, and therefore it is all right One advantage of these mixtures is, that as the linseed is cracked, cold water *may* be used in place of hot, as more handy.

Of these meals, 3 lbs. or 4 lbs. per head stirred up in lots of water and intimately mixed with straw-chaff will be sufficient. The process is the same as the one previously described.

Where ensilage is made, I should trust to the moisture of that conserve to moisten the straw, still allowing the mixture to lie for some hours in a well raised heap. Of course, meal of some sort must be given separately to the cows : I would not mix it with the ensilage. (1) Of the two, I should use the pease-mixture with ensilage.

Where roots are grown for milch-cows, and butter made from the milk, it is a matter of great importance to obviate the slightest risk of the taste of the roots affecting the product. To this end, give the roots either during milking or immediately after– digestion will in most cases carry off the flavour.— Either of the mixtures Nos. 2, 3, may be used with roots.

Of straw, prepared in either of the above ways, a fair sized cow, say 1,000 lbs.– will consume about 3½ bushels. Any quantity of chaff may be cut at a

(1) I do not mean that the meal should be given alone, but mixed with straw-chop, wet or dry.

time, provided it is tramped down tightly in a close bin and kept covered from dust and damp.

As for the cost of these mixtures, it is rather difficult to fix a price upon them, as all the ingredients are supposed to be produced on your own farms. But (No. 1) taking linseed at 1¼ cent a pound, and allowing a cow to be 200 days at stall-feeding, she would consume 150 lbs. during the winter months, costing, nearly, $1.90.

No. 2 would cost an additional sum of $6.00, and No. 3 about the same, or altogether for full feed of 3½ lbs. of linseed, oats, and pease or corn—$7.90, for the winter season: only 3½ cents a day—not a very expensive food.

Those of you who live near the great centres can, I am told, buy cotton-seed meal for $23.00 a ton of 2,000 lbs.; about a cent and a tenth per lbs. This, diluted with plenty of water, and scattered over the chaff, as before, must be cheap food. When I was farming, it was not to be had at less than $30.00 a ton, and freight from Montreal, cartage, &c., brought it up to $33.00. The other mixtures I have used largely myself, both here and in England, and can recommend them.

Lastly, every milch cow should have, if she is giving a fair lot of milk, 8 lbs. or 10 lbs. of long hay the last thing at night. Somehow or other it seems to help the digestion of the other foods, and as hay is so very plentiful, it cannot be an expensive mode of doing justice to the animals from which you will, I hope, in future derive a profit which was non-existent during the past, when there were very few cows in milk during the winter months throughout the province.

(*Read, in French, at Arthabaska.*)

ARTHUR R. JENNER FUST.

NOTES ON BUTTER-MAKING.

Mr. President and Gentlemen,

My voice will have such a feeble sound after the eloquent passages we have just listened to, that I hope you will treat me with great tenderness.

I was asked to give a lecture on the conversion of milk into butter. My knowledge of this art not being so extensive as I could wish, I fear I shall weary you; were it otherwise, I should esteem it a great honour to address you. Still, I will impart to you such operations as I made last summer, and, in order to be more concise, I will divide my matter into three principal parts.

1. Of the different breeds of cows and the treatment they ought to have;

2. The care the patrons ought to bestow on their milk; 3. The different methods of skimming, and of churning.

1st. point: I shall not pause to discuss this point, since it has been frequently treated by more competent men than I before meetings like the present.

2nd. point: Care of the milk by the patrons. Here, gentlemen, I address the patrons of creameries. Many of them think that as long as their milk is accepted at the factory, that is sufficient for the making of as much butter as can be got from it. This, however, is a great mistake; I do not accuse any one of conscious dishonesty, but, not being aware of the losses they are incurring, they continue to behave in their accustomed manner.

I have frequently observed that, after a sudden change of temperature, we have had a change in the yield of butter. If, after a few cool days a warm night succeeds, we feel sure that a pound or a pound and a half additional of milk will be required to the pound of butter; and apart from any sudden change of temperature, it is but seldom we can get the same yield several days running. Even in ordinary weather, we find a difference, from day to day, of a pound of milk. But let us take an instance: A creamery that receives 10,000 lbs of milk a day, and uses one pound of milk extra to make the pound of butter, would be losing 17 lbs. of butter a day, and, taking the working season at 6 months, would suffer a total loss of 2,000 lbs. of butter equal to from $350 to $400! Patrons will say that this is an exaggeration, that it is impossible. True enough, it may seem extraordinary to those who have never worked in a creamery, nevertheless it often happens; I will even assert that this is, so to speak, the least of the losses incurred by the fault of the patrons, whereas, if they were to follow the advice given them by every butter-maker, the above sum of $400 would be turned from a loss into a profit in every creamery in the province. The surest remedy for these acts of negligence is the payment for milk in proportion to its richness in cream estimated by the centrifugal separator (*contrôleur*).

3rd. point: *The different modes of skimming and churning the cream.* I must tell you, to begin with, that I am far from being able to lay down positive laws in these matters; but, as I said before, I will relate to you such observations as I have made during my experience in butter-making. I will, then, first speak of the modes of skimming, then of the care to be taken of the cream and, finally, of the process of churning.

Skimming by means of the separator is now acknowledged to be the best way, since it gets 10 o/o more than any other method; but great care must be taken in the operation, and especially as to the pace of the machine: it should always revolve at the same speed. The management of the cream that I recommend is not the same as I practised during the past season:

instead of cooling my cream as it leaves the separator, I now leave it to acquire a slight degree of acidity for three or four hours, and then cool it so that it may be at 54° or 55° the next day at churning-time.

I am satisfied with this method; but, after examining my report of last year and my practice of this summer, I cannot tell which is the better: to cool the cream as soon as it leaves the separator to 40° or 42° and warm it in the evening ready for the next day's churning, or the method I adopted this year. For by both methods I have obtained the same results at the same period of the year, that is, I have made a pound of butter from 23⅓ lbs. of milk; although my report shows an average of 24 lbs. for the month of July, I can tell you that on several days I made the pound of butter with 23⅓ lbs. of milk.

Now, as to churning:

I am perfectly convinced that churning should be done at as low a temperature as possible, that is, that in the great summer-heats we should churn at 54°, provided that the churn be not more than half full of cream; for, otherwise, the cream would swell and a loss of yield would be the consequence. The time of churning should not exceed 45 minutes, and the *barrel*-churn should make at least 55 to 60 revolutions a minute. As to the pace of the other sorts of churns, I can say nothing, for I have never used them.

This is how I explain the matter: According to many authors, butter exists in the milk in globules more or less large; now, it is those little globules that we have to detach from their envelopes and to do that requires the churning to be done rapidly and at a low temperature; for, if the cream be a little too warm, I believe that all the smaller of these globules, instead of developing and turning into grains of butter, will, on account of their small size and their want of consistency, remain in their primitive condition, and leave the churn with the butter milk; and this will account for small yields of butter. The butter-milk, in this case, will be richer than when a low temperature and a rapid pace are observed in churning.

As I told you, these are only observations made by me during my butter-making experience, but if they should be of use to any one, I shall be well paid for my trouble. Still, as these observations are only the commencement of our path towards perfection in the manufacture of butter, it is much to be wished that the Government would assist our Association by paying a good butter-maker to repeat these experiments several times, that we may ascertain what are really the best methods. For, in truth, if these are left to the initiative of private persons, many years may elapse before we can make sure of extracting the whole of the butter from the milk delivered at the creameries.

Begging you to excuse me for having detained you so long, I thank you for your kind attention.

ALEXIS CHICOINE.

FEDERAL MEETING OF THE DAIRY-ASSOCIATION OF THE DOMINION OF CANADA AT OTTAWA.

Mr. W. H. Lynch, of Danville, P. Q., is well known to all our readers as one of the most earnest and active promoters of the dairy industry of our province. When we say "of our province," we say less than the truth, for Mr. Lynch has done his best to promote this industry not only in all the provinces of the Confederation, but even in distant England. Again, last winter, pursuing without cessation his arduous undertaking, he published through the press a series of letters on the dairy industry which have no doubt attracted the attention of the entire agricultural public. In the fourth of these, Mr. Lynch put forth the idea that a Federal meeting of the Dairy Association of the Dominion would be of immense benefit in regard to the promotion of the interest of the industry which these associations represent. Mr. Lynch proposed in his letter that the meeting should be held at Ottawa, during the session, with a view to the obtaining of the aid and patronage of Parliament.

To-day, we are happy to say that this idea of Mr. Lynch has made its way, and, thanks to his efforts and his energy, has been realized in action. On the 9th and 10th of last April, the capital of the Dominion saw assembled within her walls delegates from all the dairymen's associations in the Confederation, for the purpose of discussing the numerous questions of general interest which demand the attentive study of all those who, in whatever way, are interested in the prosperity of the dairy-industry.

Thanks to the kindness of the Speaker of the House of Commons, the meeting was held in the committee-rooms, and the sittings were opened on the 9th of April.

FIRST DAY OF THE MEETING.

MORNING SESSION.

The first session was held in Committee-room No. 50, at 10.30, A.M.
Seven societies were represented :
The Dairymen's Association of Manitoba ;
The Creameries' Association of Ontario ;
The Dairymen's Association of Western Ontario ;
The Dairymen's Association of Eastern Ontario ;

The Dairymen's Association of the Province of Quebec ;
The Dairymen's Association of Nova-Scotia ;
The Farmers' Association of New-Brunswick.

The following delegates from these associations were present at the meeting : Messrs. D. Derbyshire, Brockville, president of the Ontario Creameries' Association; Prof. Barnard, Secretary of the Council of Agriculture, P. Q. ; Eagar, Morrisburg, Ontario ; H. S. Foster, Knowlton, Quebec, president of the Brome agricultural society ; de la Bruère, St. Hyacinthe, president of the Dairymen's Association of the Province of Qusbec ; N. Bernatchez, vice president of the Dairymen's Association of the Province of Quebec ; J. de L. Taché, secretary of the Dairymen's Association of the Province of Quebec ; Louis Beaubien, Montreal ; Col. the Hon. W. Rhodes, Commissioner of Agriculture of the Province of Quebec ; D. A. MacPherson, Lancaster, Ont. ; Col. Patton, Knowlton, Que. ; E. Caswell, Ingersoll, Ont., an eminent member of the Western Ontario Dairymen's Association ; Alexis Chicoine, St. Marc. Quebec, director of the Dairymen's Association of the Province of Quebec ; McInnes, Ottawa ; J. W. Rathbone, Montreal ; Major Boulton, Manitoba ; A. Lespérance, St. Timothée, Quebec ; Mr. E. E. Spencer, Frelighsburg, Quebec ; James Haggerty, West-Huntingdon, Ont. ; Thomas Ballantyne, Stratford, Ont. ; J. B. Lane, Dorchester, Ont. ; Prof. D. M. Robertson, College of Agriculture, Guelph, Ont. ; W. K. Everetts, president of the Eastern Ontario Dairymen's Association, Easton's Corners, Ont. ; Rev. Théophile Montminy, priest, St. Agapit, Quebec ; H. Beatty, Stanbridge-East, Quebec ; G. Peplow, Perth, Ont. ; J. C. Chapais, St. Denis, Kamouraska, editor of the *Journal d'Agriculture*, Quebec. The following members of the House of Commons and of the Senate attended the sessions of the meeting : The Hon.—La Rivière, St. Boniface, Man. ; D Cameron, Dr Robertson, S. Fisher, M. P., Brome ; Messrs. Edwards, Wood, (Westmoreland, N.-B.) ; Couture, McMillan, (Ont) ; Garth, St Thérèse, Que. ; Philippe Landry, Villa Mastaï, Que. ; Peter White, Dr Sproule ; Senators Reed, Ogilvie, and Robitaille, &c., &c.

Messrs. Chs. Gibb, Abbotsford, Que., and A. Struthers, Manitoba, excused themselves, by letter, from attending the meeting.

Mr. W. H. Lynch, the organizer of the present meeting, requested the delegates to elect a president and secretary before proceeding to business. Mr. H. S. Foster was unanimously elected president and M. J. de L. Taché, secretary.

The president then invited Mr. Lynch to lay before the meeting the questions which in his opinion ought to form the basis of its deliberations. Mr. Lynch, on rising for that purpose, was greeted with much applause. He was happy to say that three associations of Ontario, three of Quebec,

one of New-Brunswick, one of Nova-Scotia, and one of Manitoba, nine societies in all, had replied to his invitation to meet there to-day. If he had desired to call together a meeting of this kind, it was because, though the local interests of the dairy-industry were studied by the local dairymen's associations, the general interests of the said industry were neglected, on account of the impossibility, experienced by the local societies, of promoting these general interests. It was, therefore, to apply a remedy to this state of things that he had thought of convoking delegates from the different local societies—that those questions which extend beyond the limits of these societies might be discussed among themselves, and he thought that the first thing to be decided by the delegates was the creation of a Federal Association of the dairy-industry. When this association was once in existence, it might adopt as its programme the suggestions that had been made to him, in a letter, by Mr. Edward Barnard, secretary of the Council of Agriculture of the province of Quebec, which stated that the work of the Federal Association should be, in particular, to study the state and requirements of the markets in which thé Canadian dairy-products are sold, to cause experiments to be made on the most perfect way of manufacturing dairy-products, and to encourage the establishment of local dairy-associations. The appointment of a commissioner of the dairy-industry would favour the carrying into effect of this programme. The new association, once started, should be incorporated by act of parliament, and consequently, should draw up a constitution, to be elaborated by a committee specially named for that purpose. Mr. Lynch, after requesting the president to ask the delegates to express their views on the ideas he had laid before them, took his seat.

The president invited Mr. MacPherson to give his opinion. That gentleman observed that the dairy-industry was, perhaps, the most important of all industries, because, not only had it a direct effect through the pecuniary advantages offered by the sale of its products, but the indirect, though considerable effect it exercised on the whole system of agriculture must be considered as well.

The business of the present convention was to provide that the general benefits that proceed from this industry be fairly put before, and placed within the reach of, every one. He compared the good already produced by the dairy-industry and that which it might produce in the future if a Federal organization were established which would enable all its advantages to be developed. Such an organization, especially if it were supported by the Legislature, would be productive of great good. In a few words, this should be the programme of the proposed Federal association : The prevention of the frauds committed in the factories, on the farms, and in the towns ; an

enquiry into the means of facilitating the export of the products, which now suffer greatly from the defects in the means of transport employed. The latter point might be greatly elucidated by a consideration of the experience gained by the *Live Stock Association of the Dominion.*

Mr. S. Fisher said that, to embody the excellent ideas of Mr. MacPherson, a committee of organization should be appointed.

Mr. Louis Beaubien said it had been proposed to draw up a constitution. The shorter it was the better, in his opinion. It might even be done without. A practical piece of work was what was wanted: all local questions being pretermitted.

Col. the Hon. W. Rhodes observed that the Dominion of Canada was of all countries the one best suited to the development of the dairy-industry, and, consequently, the creation of the proposed Federal association must produce excellent effects.

Mr. D. Derbyshire earnestly supported the ideas of Mr. Louis Beaubien. The new society should labour to obtain uniformity of manufacture and of the packing of the products of the dairy, and to spread abroad a knowledge of the best methods of making butter and cheese.

Mr. E. Caswell spoke forcibly against the frauds committed in the matter of milk, cheese, and butter. The new society must organize an efficacious service of inspection. The Canadian dairy-industry is on the road towards improvement; still it must not loiter, but advance continually, unless it wished to be distanced.

Mr. Barnard showed how important it was to collect into one body from all parts of the province men skilled in the dairy-business, and what good results must spring from such a reunion.

The Hon.—Larivière related what things had been done for the dairy-industry in Manitoba.

Mr. Boulton also spoke on the state of the dairy-industry in Manitoba, and enlarged on the advantage offered to its development by the Dominion of Canada.

Mr. Robertson, member of parliament from Prince Edward's Island, said that farming and dairying could not exist without one another, seeing that they afforded each other mutual aid.

Mr. Cameron, of Nova Scotia, told how the dairy-industry was beginning to interest every one in that province.

Mr. Couture, member for Chicoutimi, Quebec, gave the meeting an account of the progress of dairying in the Saguenay district.

Messrs. Patton and Lane enforced the necessity of organizing a good system of inspection.

Mr. White, president of the agricultural committee of the House of Commons, said he came there to learn and not to teach.

M. Chapais observed that, although Mr. Beaubien had said a short time previously that there was no need of an elaborate constitution, his own opinion was that if the proposed association desired the aid of the Government, it must prove that it is regularly incorporated, and, in order to obtain incorporation, the association must be prepared with a constitution of some sort or other. He then gave some details of the revolution that the dairy industry had produced since its development in the Eastern part of the province

Mr. Everetts spoke of the enormous sums expended by the Government of the United States for the promotion of the dairy-industry, saying that this ought to induce our Government to assist us.

Mr. Barnard submitted to the convention four points which he thought ought to engage the attention of the new society as soon as it was established :

1. To aim at encouraging the manufacturing of the best products ;

2. To study the very important question of the outlets and markets to which the products of our dairies are sent ;

3. To study most attentively the demands of these markets ;

4. To seek to improve, generally, the dairy industry, and to make the manufacture of the different articles cost as little as possible.

The delegates unanimously adopted a resolution deciding that, as the practical result of the present convention, a Federal convention of the dairy-industry be founded, and that an organizing committee of the said association be appointed.

The committee was immediately named, consisting of the following gentlemen :

Messrs. D. M. MacPherson, Louis Beaubien, W. H. Lynch, J. C. Chapais, E. Caswell, P. B. de la Bruère, Ed. A. Barnard, Major Boulton.

The newly appointed committee fixed its first meeting at 2 P. M., and the general session was adjourned till 3 P. M.

AFTERNOON SESSION—SESSION OF THE ORGANIZING COMMITTEE.

The committee met at 2 P. M., in the committee room, No. 50, of the House of Commons.

Mr. J. C. Chapais was elected chairman, and Mr. W. H. Lynch secretary of the committee.

The chairman submitted the discussion of the clauses of the constitution to the committee, and the following were unanimously adopted.

1. The name of the new association shall be: *The Dairymen's Association of the Dominion of Canada.*

2. The aim of the association shall be to promote the general interests of the dairy-industry in the Dominion of Canada.

In order to become a member of this association it shall be necessary for the postulant to be a member of one of the regular district or provincial associations, except in the case of senators or members of the House of Commons, who shall be *ex-officio* members of the association.

The association shall be under the control of the president, a vice-president for each of the provincial associations, a secretary, a treasurer, and three directors for each of the provinces of the Dominion, in conformity with the act of incorporation, all of whom shall compose the board of directors of the association, and report to the said association at its general meeting.

The hour of the general session having arrived, the present session of the organizing committee was adjourned.

GENERAL SESSION— AFTERNOON.

The session opened at 3 o'clock in the railroad-committee-room. Mr. H. S. Foster took the chair. Mr. Fisher informed the meeting that Mr. Peter White, the chairman of the agricultural committee of the House of Commons, wished to know at what time the convention desired to meet the committee for the purpose of explaining its views to the members of the committee.

It was arranged that the delegates should meet the committee at 10 A. M. of the next day—Wednesday.

Mr. W. H. Lynch, secretary of the committee of organization, made a report of the session of the committee, an account of the proceedings of which we have given above.

Col. the Hon. W. Rhodes, seconded by Mr. Ed. Barnard, proposed that the elections of the new association be proceeded with. The proposal was adopted, and the following officers were unanimously elected:

PRESIDENT.—Mr. D. M. MacPherson.

VICE-PRESIDENTS.—The presidents of all Provincial Dairymen's Associations.

SECRETARY.—M. J. C. Chapais.

TREASURER.—Mr. H. S. Foster.

DIRECTORS.

ONTARIO.

Messrs. W. H. Eagar, Morrisburg, Ontario
James Haggerty, West Huntingdon, Ontario.
E Caswell, Ingersoll, "
Thos. Ballantyne, Stratford, "

QUEBEC.

Messrs. Louis Beaubien, Montreal, Quebec.
Col. Patton, Knowlton, "
M. Bernatchez, Montmagny, "
Ed. A. Barnard, Quebec, "

NEW-BRUNSWICK.

Messrs. Julius N. Inches, Fredericton, New-Brunswick
Arthur C. Fairweather, Rothsay, "
George Fawcett, Sackville, "

NOVA-SCOTIA.

Messrs. L. C. Archibald, Antigonish, Nova-Scotia.
Paul C. Black, Falmouth. "
John McKeen, Mahon, Cape-Breton.

PRINCE EDWARD'S ISLAND.

Messrs. The Hon. Alex. Laird, Bedique, Prince Edward's Island.
Hon. D. Ferguson, New-London, " " "
John Hamilton, New-Perth, " " "

MANITOBA.

Messrs. Major Boulton, Shellmouth, Manitoba.
Hon. Clifford (?) — "
S. M. Barré, — "

NORTH-WEST TERRITORY.

Mr. Jos. P. Dill, Wolseley, North-West Territory.

The elections being over, the members of the convention, at the invitation of Prof. Saunders, visited the Central Experimental Farm at Ottawa, and a most interesting visit it was, particularly as regards the splendid stables, cattle-sheds, hen-houses, and the experiment-rooms for grain and seeds. There are no stock on the farm at present, except some very fine horses, as the establishment has only just started into life; still what the

members of the convention saw there promised much for the future. Nothing could exceed Prof. Saunders' kindness and attention.

EVENING SESSION,

The first evening session of the Dominion Dairymen's Association was opened at 8 P. M., Mr. D. M. MacPherson in the chair.

The chairman introduced Mr. Adam Brown, M. P., who, addressing the meeting in a pleasant speech, told them how deeply interested he was in the industry they represented. It was he who put the first box of Canadian cheese on the English market. He promised his aid to the new association founded by the delegates present. The dairy-industry had done a great deal in the past, said he, but it promised to do still more in the future.

Dr Sproule, M. P., spoke after Mr. Brown, showing the value of the new association and the good it must produce.

Major Boulton, seconded by Mr. Everett, then proposed that the next meeting of the association be fixed for the second Tuesday in the next session of the Federal Parliament, so that the Legislature may have time to consider the important questions the associations may have to submit to it. Carried unanimously.

Messrs. Lane and Derbyshire pointed out to the meeting the great importance of *quality* in the products of the dairy, saying that it was one of the points to which the attention of the association should be most particularly directed. Pains should be taken to unmask the numerous frauds practised in the "handling" of milk from the time it leaves the cow's udder until it arrives on the market in the form of the finished product. To insure this, a well-planned system of inspection must be organized by the association.

Messrs. Caswell, MacPherson, Taché, Everett, Fisher, Foster, Payne, gave their opinions on this matter. Major Boulton made some remarks on the advantages the *assay* of milk offered to the factories in the detection of fraud.

Mr. Edward Barnard said before a solution of all the questions which had been put forth by many of the delegates could be arrived at, the Government must be solicited to appoint a Dairy-Commissioner. This suggestion was accepted, and a resolution to that effect proposed by Major Boulton and seconded by Mr. E. Caswell in the following terms :

Proposed and unanimously resolved : that the Government be prayed to appoint a Dairy-Commissioner whose duty shall be to watch over the interests of the dairy-industry of the Dominion of Canada.

And the session was adjourned to 10 A.M., the next day.

SECOND DAY.

MORNING SESSION.—INTERVIEW OF THE DELEGATES WITH THE COMMITTEE OF AGRICULTURE.

The delegates having assembled, they were introduced to the president and the members of the Committee of Agriculture, in their committee-room, at 10.30 A-M.

At the invitation of the president of the committee, Messrs. MacPherson, Robertson, Bolton, Beaubien, Caswell, and Derbyshire related to the members present the object of the interview, which the members of the committee having listened to, they expressed their interest in what they had heard by adopting the following resolutions :

1. Proposed by Mr. T. Sproule, seconded by Mr. Hesson, and resolved unanimously : that in view of the extension and importance of the dairy-industry of Canada, and the necessity of protecting its interests, the committee thinks it its duty to recommend the appointment of a Dairy-Commissioner whose duty it shall be to watch over and promote, as far as possible, the progress of the different branches of this important branch of the national industry.

2. Proposed by Mr. Fisher, seconded by Mr. McNeil, and resolved unanimously : that the committee has learned with satisfaction the creation of the Dairymen's Association of the Dominion of Canada, and is of opinion that, considering the general advantages which must be derived from the labours of this association and the extensive programme which it has to go through, every possible encouragement should be afforded it.

After the adoption of these resolutions, the delegates retired with the intention of meeting again in session at 2 P.M.

AFTERNOON SESSION.

The session was opened at 2 P.M. in the Central Tower ; Mr. MacPherson in the chair.

Mr. Lane, seconded by Mr. Foster, proposed that the association ask the Federal Government for a grant of $3,000, as an aid to its organisation, and to enable it to realise the execution of the different points of its programme.

Before the discussion of this proposal, certain remarks of M. Thos. MacFarlane, analyst of the department of Inland Revenue, were heard, imparting to the meeting his views and ideas on the adulteration of milk, on the analyses to be made for their detection, the system of inspection to be adopted, and the advisability of establishing a legal and official standard of the composition of milk.

Messrs. Bruère, Barnard, Derby, Fisher, Robertson, Sproule, Lane,

Taché, Haggerty, Boulton, took part in a lively discussion on the remarks of Mr. MacFarlane ; after which, the motion of Mr. Lane, mentioned above, was passed unanimously.

After a fresh discussion with respect to the establishment of a legal and official standard of the composition of milk, in which Messrs. Fisher, Sproule, Everett, Boulton, Lane, Foster, Robertson, Taché, Patton, Carpenter, took part on one side or the other, it was decided that at present it was not advisable to fix this standard, and the subject was remitted for discussion at the meeting of next year.

The delegates were informed that the Rt. Hon. Sir John A. Macdonald, having been requested to grant an audience to the delegates, informed them that he would be ready to receive them at 8 P.M. Messrs. MacPherson, la Bruère, and Robertson were appointed to address the prime-minister, and the session was adjourned to 7.30 P.M.

EVENING SESSION.—INTERVIEW WITH SIR JOHN A. MACDONALD.

At 8.30, the delegates were introduced to the Premier, in his private room, and found with him three other Ministers : the Hon. Messrs. Carling, McKenzie Bowell, and Costigan. The following members of the House accompanied the delegation : Messrs. Taylor, Marshal, Choquette, Hickey, Sproule, Ferguson (Leeds), Coughlin, Carpenter, Innes, Fisher, Adam Brown. Dr. Sproule introduced the delegates to the Premier. Messrs. MacPherson, Robertson, Foster, Larivière, Brown and Sproule related to the Premier the desires and views of the new association of the dairy-industry, a deputation from which was present, and requested him, in particular, to appoint a Dairy-Commissioner, and to grant the association a sum of $3,000 to enable it to accomplish the task it had set itself to discharge.

The Right Honourable Premier replied that he was well informed as to the progress of the dairy-industry of the Dominion af Canada. He knew it to be one of the most powerful promoters of agricultural, and therefore of national prosperity. He remembered still the first cheese—made by his mother—that he had tasted. He knew that the manufacture of cheese had improved more than that of butter, and advised the new association to try to improve the butter produced in the Dominion. He recognized the usefulness of a Dairy-Commissioner, and would confer with his colleagues on the advisability of appointing such an officer. As to the grant asked for, he would be glad to have, in writing, a description of the mode in which it was proposed to expend it, and requested Prof. Robertson, who had just addressed him, to prepare such a description and to submit it to him.

The delegation then retired, enchanted with the pleasant manner with which Sir John Macdonald had received them.

CLOSING SESSION

At 9.30 P. M. the delegates met for their last session, and appointed a committee on organization to replace that already named, which had not been able to finish the work of elaborating the constitution of the association.

The committee selected was composed as follows: Mr. MacPherson, chairman, Messrs. Ed. Barnard and E. Caswell.

It was then decided that Prof. Robertson, who had kindly consented to undertake it, be entrusted with the duty of preparing the memorandum, on the employment of the grant, requested to be furnished to the Government, and which the prime-minister had asked the professor to prepare.

A resolution was also passed unanimously, to the effect that Mr. W. H. Lynch be repaid all the expenses he had incurred in organizing the present convention, and the convention was dissolved, with the intention of meeting again on the second Tuesday of the next session of the Federal Parliament at Ottawa.

J. C. CHAPAIS,

Sec. Dairymen's Ass. Dom. Canada.

REMARKS BY MR. BARNARD.

We have had the pleasnre, during the last few days, of meeting some of the principal officers of the Dominion Dairymen's Association, and it is decided that there shall be a meeting, not exactly at the date mentioned in the report you have just heard read, but at the same time as that of the Horticultural Society, that is to say, one immediately after the other.

Both societies have to contend with the same difficulty: the preservation of easily spoilt goods. Butter, before it reaches the market, requires peculiar care; first in its manufacture, next in its voyage, and, in fact up to the very moment of its delivery to the purchaser. And precisely the same is it with fruit. The thing is, to deliver on the market, whether in China or Japan, a perfectly fresh and Canadian product.

We shall therefore hold a combined meeting of these two associations whose interests are in common.

Up to the present time, the fault found with our products has always been that, excellent as they are at first, they do not retain their quality, and always end by being classed as second, third, and fourth-rate on the market.

This, then, is the reason why we have been induced to put off the combined meeting to the third week in February ; it is a very important one, and every delegate should attend it. Every point connected with the production of milk and of butter will be discussed at it.

We thought that our convention, a very good one as regards our province, could not be equal to a meeting, at which the most distinguished men of North America, Canadians as well as men from the States, should be present. The Dominion Dairymen's Association hopes to draw to Ottawa the most distinguished men of the whole continent, and when I use that expression I wish to be well understood. By *distinguished* (*marquants*), I mean to convey the idea of *perfection*, not in theory only, but in practice as well. I do not depreciate science ; on the contrary, science enlightens practice ; but what practice requires is a perfected science, not a half-and-half sort.

I gladly bear witness in favour of the province of Quebec, as to the following point : last year, the Dairymen's Association was represented at Ottawa by its officers. Do you know, gentlemen, what the general opinion was ? I was not a delegate, but I too was called to Ottawa, and, as a simple individual, I could form a good idea of the wisdom evinced by that association in sending its delegates to Ottawa. The general opinion was this: the representatives of the Quebec Dairymen's Association were among the most distinguished men of America.

Mr. MacPherson.—I invite you all cordially to the Federal convention of the dairy-interest, which will take place at a date to be made known hereafter. Its programme will be excellent. You will derive great profit from this convention, and, in addition, will have the advantage of visiting the experiment-farm. I hope to see the province of Quebec well represented there.

AN ENGLISH- SPEAKING ASSOCIATION.

Mr. Foster.—I am here with a view of getting you to work with me in the establishment of an association like yours, in the Eastern-Townships. We desire to introduce into our parts what you have done here: the perfection of work in the most approved style of factories.

I feel that it is of very great importance that something be done to encourage the farmers of the Townships. We started, last winter, at Bedford, an association intended to be an imitation of yours. We feel the value of your system of management and inspection, and we ask you to make use of your influence with Col. Rhodes, that something may be done in favour of

that district which, up to the present time, has been neglected, I do not say by you, but by the very people of the place.

I beg you ro recognize, and to persuade others to recognize, the justice of our claims.

Mr. Callum.—We are convinced that of late years the French-Canadians of Quebec have surpassed us. The dairy-industry has been developed among them much more rapidly than with us. For this there is a reason. Our people build in the middle of their farms; the French Canadians on the road at the extremity of theirs. They thus have less trouble in carting their milk to the factory. But we have now entered upon the movement; we wish for an association like yours in the district of St. Francis, with a grant to help it to support itself. Still, I know there is a difficulty in getting grants for several different places.

Mr Barnard.—You have hit the weak point. There are 60 counties in Quebec. If the Commissioner were to grant $60 to one county, he would have to grant the same sum to all the 60, and 60x60 make up a sum for the granting of which Parliament must be consulted. The English farmers of the province of Quebec, of Bedford, Huntingdon, &c., ought to establish a dairymen's association as the French-Canadians have done. Before leaving this place set the thing going; under the direction, for instance, of Mr. McPherson. As soon as the English-speaking farmers get up a dairymen's association, I am sure—but I do not pretend to be speaking in the Commissioner's name—that justice will be done to them. (1).

Mr Foster.—Still, I think your association could help us a good deal, even out of the $10,000 it receives.....

Several Voices.—But we only get $1,000 a year!

Mr. Foster.—Then, gentlemen, you have really done wonders with such a mean grant.

CLOSE OF THE CONVENTION.

The President.—The hour of closing this convention, gentlemen, has now arrived. I repeat my expressions of regret at the resignation of M. de LaBruère, who has, up to this day, presided over this association. I trust he will continue to afford us his assistance, and that his counsels and experience will render my task less difficult.

Very interesting are these meetings; the more frequently one attends

(1) Cannot a less clumsy term than "English-speaking men" be invented? "French-Canadians" is all right: how would "Iro-British" do? Trans.

them, the more one wishes to attend them. I congratulate you, gentlemen, on the numbers here present, and I hope that you will continue to frequent these meetings with the same earnestness that you have hitherto displayed.

We are deeply indebted to all, especially to the inhabitants of Arthabaskaville, for the cordial reception they have accorded us. Every family has received us with the most heartfelt, gracious welcome. We have all been enchanted with this friendly reception. We must also thank in an especial manner the distinguished men who have kindly attended our deliberations, notably, the Hon. Minister of Agriculture and the Hon. Wilfrid Laurier.

The Commissioner is delighted with the way in which the discussions were conducted, and with the interesting topics that were canvassed. He is thoroughly convinced of the importance of this association and of the utility of these meetings.

I must also thank all those who came hither to attend our debates, the distinguished members of the clergy, and those who came from abroad. I trust we shall see them all again at Sorel, next year.

This year, the lectures and debates have been highly interesting. But we must not be satisfied with having listened to and admired them, we must put in practice the lessons they have taught us. Let every maker of cheese or butter who has not all the necessary skill pass some days at the school-factory. With their previous attainments, it will be enough if they receive a few explanations from the instructor, and watch him at his work for two, three or four days.

If certificates were demanded from the makers, they would soon take pains to procure them. But, at present, a man goes and passes a month or two at a factory, and immediately gives himself out as a maker. Hence, that state of things which the reports point out, and which must be altered as soon as possible.

In conclusion, I again thank you for the honour you have conferred upon me. My only regret is that I fear I am not competent to discharge the duties of my position ; but I greatly count upon the aid of the devoted members of this Association ; and, on my part, I will strive to become worthy of the post you have assigned me.

Should it be in my power, as a member of the House, to aid the association, you may feel sure I will not fail to do so.

Mr. CHAPAIS.—Mr. President, a few minutes ago you expressed your gratitude to the inhabitants of Arthabaskaville, but their reception of us has been really so cordial that I think we ought to pass a special resolution to that effect, which shall be entered in our reports. And, so, I will request Mr. Taschereau to second the following resolution :

That the members of the Dairymen's Association, at their final session at Arthabaskaville, thank most heartily all those of that town who have shown them such hospitality, not only on account of their liberal attention to the physical needs of us their visitors, but also for the kind and cordial manner in which we have been treated.

They received us, each into his own home, they put us so much at our ease, made our stay so pleasant, that we lament the necessity of leaving them, though, of course, to them it will be a relief.

Once more have they, in order to receive us, been obliged to make sacrifices, if not of their feelings, at least of their rooms.

Mr. BERNATCHEZ.—Yes, and the Sheriff and other authorities who have allowed the use of this hall.

Mr. LAVERGNE.—As the representative of this county, I will take upon myself to reply on behalf of my constituents, and to thank the officers of the association, who have enabled us to listen to the debates in this place, as well as the members who have lent their aid to this meeting.

The good effects of this convention are already perceptible: the people of the county purpose to make many improvements, to buy thoroughbred stock, &c.

In a small village like this, you must not expect to be received as in a town.

Mr. BARNARD.—You have done more: you have received us like princes.

Mr. LAVERGNE.—Well, the village is small, and we cannot do as we might do if it were a town. Still, I know that my friends and all the people have had great pleasure in affording you the reception you speakof. Our only regret is that your visit has been so short. We should like to keep you longer, not only because your meeting has been useful and interesting, but because it has also been a source of pleasure to us. We meet here old friends and make new ones, and it is always a pleasure thus to extend one's social relations.

We are sorry to see you leave us, and I hope you will be persuaded to return, and the next time we will try to entertain you better than we have done on this occasion.

Mr. BARNARD.—A near relation of the Commissioner tells me that the Minister is willing to grant the association $5 as a fee for each lecture delivered here. I think the association ought to send in an account to the commissioner of $5 for each lecture.

COL. RHODES.—A man full of good feelings towards this association would easily hit upon means of proving the sincerity of his sentiments. A certain sum is allotted by the Department of Agriculture for each lecture

given in the country, the agricultural societies making choice of their own lecturer. All that we, in the department, have to do is to ratify their choice if we do not think him unworthy of our confidence. When the lecture has been delivered, the lecturer has only to hand over to us the certificate of the chairman of the club, and we pay him the five dollars without more ado.

Full as I am of good feeling towards you, in seeking for means to assist your society, I have hit upon this one. A thousand dollars were voted for lectures, and of these only $400 were expended. If you were to ask for them I think we might, out of the $600 remaining from the grant, give you $5 a lecture, which, for say 20 lectures—taking the discussions as lectures—would be $100. I must, of course, consult the assistant-commissioner, and other members of my department, before paying this sum; so I cannot make any formal promise, though I do not look for any opposition, considering the source whence this money is derived.

I advise you to address a petition to the Minister, showing the value and usefulness of these lectures and asking for a grant of $5 for each of them.

REPORT OF THE COMMITTEE ON UTENSILS

Two apparatuses were exhibited;

1. A butter-worker with a horizontal table. Not so good, it was thought as the inclined table, which is preferred.

A churn, with a lever by which the motion is given instead of by the usual handle; the change is found to be an improvement.

COMPETITION OF CANADIAN COWS.

The following cows were entered for the competition of 1889:

1. La Caille, the property of M. Désiré Philibert, St-Justin, Maskinongé
2. La Noire, " " " M. Salomon Philibert, do do.

The yield of these cows was as follows, from the report of the tests that were made in accordance with the conditions imposed by the competition:

Test begun ☞	No. 1. La Caille 18 July 1889	No. 2. La Noire 18 July 1889
	lbs. oz.	lbs. oz.
Weight of milk each day. 1 day.....	33–11½	42–08
2 "	31–02¼	42–03
3 "	31–12	42–00½
4 "	31–08	42–04½
5 "	34–08	41–01
6 "	30–06½	41–11½
7 "	35–12½	43–03
Total for the 7 days.....	lbs. 228–13	295–09½
Total quantity of cream.	22 lbs.	36 lbs.
	lbs. oz.	lbs. oz.
Total quantity of butter	9–7½	12–13½
Yield of butter per 100 lbs. of milk.	4.14	4.35

M. Ed. A. Barnard, who examined these cows, made the annexed report:

Quebec, 25th November, 18°9.

Monsieur J. de L. Tache,

Secretary of the Quebec Dairymen's Association.

Sir,

I inspected, at M. Désiré Philibert's, St-Justin, the two cows (La Caille and La Noire) whose certificates of yield were sent to the Commissioner, with a request that they might be examined for the purpose of proving whether or not they are of pure Canadian race and fit for entry in the herd-book. Both cows will be entered at once. They are very handsome, and seem to be capital milkers, both as to quantity and quality.

I forward you, enclosed, the certificates you sent us, attesting the yields obtained in the last competition of Canadian cows held by your association.

I have the honour to be, Sir,

Your obedient servant,

Ed. A. Barnard,

Sec. Coun. of Agriculture, &c.

In consequence, the board of directors of the association decreed the first prize ($40.00) to M. Salomon Philibert, and the second ($30.00) to M. Désiré Philibert.

INVITATION

SHERBROOKE, 6TH DECEMBER, 1889.

Sir,

I have been instructed by the Sherbrooke agricultural club to address to you a copy of a resolution soliciting you to make that town the place of meeting for the annual convention of the Dairymen's Association at as early a date as possible.

Trusting that you will kindly use all your influence to induce the association to grant the request of the club, I hope shortly to receive a favourable reply.

I am, *avec considération*,

Your obedient servant,

ELISÉE NOEL,

Secretary of the Sherbrooke agricultural club.

The Hon. P. B. de LaBruère
St. Hyacinthe.

Session of the Sherbrooke agricultural club in the usual place the 10*th. November*, 1889, *at which were present several members of the club forming a quorum.*

The president, M. Eugène Bourque, in the chair. The minutes of the last session were read and confirmed.

Proposed by M. Norbert Bourque, seconded by M. Jos. Blanchard:

That it would be desirable, in the interest of the agricultural class of the neighbourhood of Sherbrooke, and to the advantage of the "Dairymen's Association," that the latter should hold one of its annual meetings at Sherbrooke.

That it is the duty of this club to invite the association to visit this town, with a view to the obtaining of this advantage for our part of the province.

Consequently, that it be resolved that the Sherbrooke agricultural club hereby invites the Dairymen's Association to hold their next annual meeting here; or, if they are otherwise pledged, the first annual meeting for which they are not under any engagement.

That the secretary of the club be instructed to address a copy of the present resolution to the president of the said association before the next annual meeting, which is to take place, in December next, at Arthabaskaville, in order that this resolution be then submitted and taken into consideration.

Carried unanimously,

(Signed) EUGÈNE BOURQUE.
ELISÉE NOEL, Secretary.

Extract from the minutes of the deliberations of the Sherbrooke agricultural club, in conformity with the said minutes.

ELISEE NOEL, Secretary

The association has received several invitations, which will probably be accepted in their turn; but it has been decided that the invitation from the city of Sorel, made last year at l'Assomption, through the agency of Dr Adolphe Bruneau, should be the first accepted. This decision of the directors was ratified by the convention, and the date of the next meeting was fixed for the end of November, 1890

LIST OF MEMBERS, YEAR 1889.

A

Archambault, J. Misaël.....St-Hyacinthe.
Allard, Jos. Napoléon.....Ste-Madeleine.
Ayotte, Ludger.....Montreal
Allard, Cyprien.....St-Alexis.
Asselin, Charles.....South Durham.
Aganière, Albert.....St-Malo d'Auckland.
Adam, Delvica.....St-Valérien.
Angers, Pascal.....Rivière-aux-Sables (Chicoutimi).
Archambault, Louis.....Grondines.
Allard, J. L.....St-Martin de Laval.
Archambault, J. B.....St-Denis.
Armstrong, A.....St-Hugues.

B

Bran, Télesphore.....Montreal.
Barnard, E. A.....Quebec.
Bellisle, Achille.....La Baie-du-Febvre.
Brodeur, L. Timothée.....St-Hugues.
Beauregard, Hector.....La Présentation.
Beaubien, Hon. Louis.....Montreal.
Bilodeau, Jean.....St-Elzéar de Beauce.
Baril, Pierre.....St-Justin.
Bourque, Norbert.....Sherbrooke-East.
Beaudry, Pierre.....St-Jean-Baptiste de Rouville.
Bergeron, O., père.....St-Athanase.
Brodie, R.....Montreal, 10-12 Bleury Street.
Bruneault, Dr A.....Sorel.
Berthiaume, Jean-Bte.....Rivière Gagnon.
Bourque, Désiré.....St-Barnabé.
Blanchard, Joseph.....Ste-Madeleine.
Boucher, Joseph.....St-Damien.
Bergeron, Henri.....St-Didace, (Maskinongé),
Beauregard, Joseph.....St-Jean-Baptiste.
Boily, Roger.....Grande Baie, (Chicoutimi).
Beauchamp, B.....St-Hermas, (Deux-Montagnes).
Bertrand, F.-X.....Ste-Croix de Lotbinière.
Blackburn, Henry.....Allen's Mills.

Brassard, Ephrem.....Roberval, (Chicoutimi).
Boulay, G.....Ste-Edwidge de Clifton.
Boucher, Bénonie.....St-Jean de Matha.
Boucher, Euclide.....St-Damien.
Boucher, Pierre.....St-Paulin, (Maskinongé).
Boucher, Louis.....Ste-Anne de Chicoutimi.
Boucher & Leclerc.....L'Islet.
Boulanger, Octave.....Ste-Agathe, Lotbinière.
Boucher, Eugène.....Windsor Mills.
Beaudry, Jos.....St-Gabriel de Brandon.
Breton, Auguste.....N. D. du Sacré-Cœur.
Buteau, Joseph.....St-Alphonse de Chicoutimi.
Boisvert, Evariste.....St-Zéphirin de Courval.
Brassard, Donat.....Rivière-aux-Sables, (Chicoutimi).
Brasseur, Xavier.....Roxton-East.
Boland, Georges.....Ste-Ursule de Maskinongé.
Beaubien, Jos.....Montreal.
Bernard, Avila.....Belœil.
Bourbonnais, J. A.....Pontchateau.
Beauchemin, Etienne.....Ste-Monique de Nicolet.
Bérard, Arthur.....Drummondvile.
Bélanger, J. A.....L'Isle Verte.
Bourgaud, Onésime.....Ste-Elizabeth de Warwick.
Bernard, L P.....Cap Santé.
Blanchette, Geo.....St-Valère de Bulstrode.
Bélanger, Jos.....St-Jean Port Joli.
Bradette, Jules.....La Malbaie.
Boudreau, Zoël.....Pointe-aux-Pères.
Brin, François.....Lawrenceville.
Beauregard, Louis.....St-Jean-Baptiste.
Brazeau, Anthim.....Roxton Falls.
Bernier, Thos.....St-Philippe de Néry.

C

Chicoine, Alexis.....St-Marc.
Chagnon, Antoine.....St-Dominique.
Casavant, Antoine.....St-Dominique.
Chartier, Rev. J. B.....St-Hyacinthe.
Couture, Dr J. A.....Quebec.
Chenevert, Jos.....St-Cuthbert.
Cloutier, Sauveur.....Ste-Sophie d'Halifax.
Chapais, J. C.....Quebec.

Coulombe, Dr J. C.....St-Justin.
Caron, Georges.....St-Léon.
Carignan, Thos.....St-Pie.
Clément, N. E.....Champlain.
Charpentier, Ephrem.....L'Avenir.
Chagnon, Samuel.....St-Paul l'Hermite.
Chabot, Georges.....St-Liboire.
Côté, Joseph.....St-Barnabé.
Caron, J. Adélard.....Richardville, Meg.
Clément, Honoré.....St-Jean de Matha, Joliette.
Choinière, Modeste.....Flodden.
Caisse, Rev. M. J. C.....Three Rivers
Côté, Rev. F. P.....St-Valérien, Shefford.
Coutier, Louis.....Louiseville.
Couture, Alfred.....St-Augustin.
Caisse, Rev. Camille.....St-Sulpice, l'Assomption.
Coulombe, Jos.....St-Norbert de Berthier.
Charest, Rev. F. M. A.....Mile End.
Cartier, T. C.....Kingsey, French village.
Clément, Joseph.....Lorette, Manitoba.
Chevrier, L. J. O.....Rigaud.
Cadieux, J. B. E.....St-Valérien.
Caron, Nazaire.....L'Islet.
Collège d'Agriculture.....L'Assomption.
Champagne, Geo.....Berthier en haut.
Cyr, Charles.....St-David, (Yamaska).
Côté, Gaspard.....St-Cyrille.
Chicoyne, J. B.....Sherbrooke.
Cossette, Ferdinand.....St-Narcisse, Champlain.
Cousineau, Jos.....St-Simon de Bagot.

D

Duhaime, N. L.....Montmagny.
DeLongchamp, Eusèbe.....St-Zéphirin de Courval.
Duguay, Paul.....South Durham.
Dumoulin, Almindor.....N.-D. des Bois, Compton.
Denis, Léopold.....Berthier.
Denis, Paul.....Vaudreuil.
Desrochers, Urgèle.....St-Thomas de Joliette.
Denis, Arsène.....St-Norbert de Berthier.
Dumoulin, Félix.....St-Scholastique (Deux-Montagnes).
Dufresne, Arthur.....Dufresne Mills.

Desrochers, Gabriel.....St-Nicolas.
Dorion, Hercule.....Yamachiche.
Dubuc, J. A.....Richelieu.
Denis L.....St-Charles.
Desmarais, Edouard.....Saint-Lin.
Desloges, F. X.....Longueuil.
Daigneault, Rev. J. C.....Ste-Julie de Verchères.
Dumaine, Aimé.....St-Edouard.
Dufault, Eusèbe.....Ste-Hélène.
Dupont, Flavien.....St-Liboire.
Dubeault, Geo.....St-Gabriel-de-Brandon.
Duguay, J. N.....La Baie-du-Febvre.
Dion, Jos.....Acton Vale.
Dépôt, J. P.....St-Valérien.
Dion, Frs.....Ste-Thérèse.
Desjardins, Antoine..... " "
Desnoyers, Michel.....St-Jean-Baptiste.
Daignault, Jean-Bte..... " "
Dumas, Pierre.....St-Norbert.
Dufault, P. E.....Ste-Hélène, Bagot.
Daoust, Antoine.....St-Benoit.

E

Esinhart, John.....Montreal.

F

Fortin, S.....St-Prime.
Fleury, Norbert.....Yamachiche.
Fradette, Norbert.....St-Dominique.
Fontaine, Siméon.....Weedon.
Fournier, O.....Gentilly.
Fleurant, Magloire.....Melbourne Ridge.
Francœur, D. L.....St-Roch-des-Aulnais.
Fontaine, Louis.....St,Germain de Grantham.
Fontaine, A.....Joliette.
Faribault, J. E.....L'Assomptiou.
Foucher, M.....St-Jacques de l'Achigan.
Fisher, Sydney.....Knowlton.
Fontaine, Alphée.....Weedon.
Fontaine, Philias.....St-Hugues.
Fortin, Jos.....St-Ours.
Forrest, A.....St Scholastique.

G

Gendron, Frs.....Ste-Anne de la Pocatière.
Gingras, Hubert.....Ste-Marie de Monnoir.
Gemme, Paul..... " " "
Giard, J. A.....Montreal.
Guertin, Alfred.....St Casimir de Portneuf.
Gérin, Rev. M. D.....St-Justin.
Guertin, Rev. M.....St-Casimir.
Gouin Chs.....Batiscan.
Gagné, Théophile.....St-Edouard, Lotbinière.
Garon, M. l'abbé L.....St-Giles.
Crenier, Joseph B., fils.....Ste-Rosalie.
Gérin, M. Léon.....Montreal.
Gagnon, Rev. F. C.....Quebec.
Gagner, Edouard.....Wickham, West.
Gouin, Alexis.....St-Félix, Kingsey.
Giasson, Théodore.....L'Anse à Giles.
Genest, Augustin.....St-George de Windsor.
Girard, Joseph.....Chambord, St-Gédéon
Girard, Luc.....Ste-Perpétue.
Grégoire, Joachim.....St-Cuthbert.
Guévremont, Séraphin.....Sorel.
Gauthier, Joseph.....St-Lin.
Guilbault, Ed.....Joliette.
Gravel, Augustin.....Louiseville.
Gérin, Auguste.....Montreal.
Girouard, M. Edouard.....South Ely.
Gilbert, Louis.....St-Zéphirin de Courval.
Garon, Emile.....N. D. du Sacré Cœur.
Gendron, Joseph.....Coaticook.
Girouard, Napoléon.....Dunham.

H

Houlde, Eusèbe.....Gentilly.
Hardy, Philias.....Pointe-aux Trembles (Portneuf).
Hudon, Philippe.....Hébertville.
Hamel, Elisée.....St-Edouard.
Houle, M. E.....Ste-Hélène de Bagot.
Houde, A. Victor.....St-Prosper de Champlain.
Houelbecq, Max.....St-Dominique de Bagot.
Harrison & Pruchon.....Matane.

Hôpital du Sacré-Cœur.....Quebec.
Houle, Aureus.....Arthabaskaville.

J

Johnson, C. E.....Warwick.
Jeannotte, Alph.....Belœil.
Jacob, Joseph.....St-Stanislas, Champlain.
Jacob, Ernest.....Ste-Geneviève, Batiscan.
Jobin, Louis.....St-Augustin.
Jacob, Léopold.....St-Tite, Champlain.
Jodoin, Joseph.....Ste-Madeleine.
Jourdain, Roch.....St-Jean-Baptiste.

K

Kirouac, Calixte.....Warwick.

L

LaBruère, Hon. B. de.....St-Hyacinthe.
Le François, Samuel.....St-Léon de Maskinongé.
Lajoie & Fils.....St-Liboire.
Lindsay, Chs. P.....Ste-Marie, Beauce.
Lambert, Félix.....St-Antoine de Tilly.
Lord, Edmond.....St-Francois de Beauce.
Langlois, Charles.....Montreal.
Lussier, E. S.....St-Aimé, Richelieu.
Lambert, J. B.....St-Apollinaire.
Larivière, P. Dr.....Trout Brook.
Lambert, Joseph.....St-Jean-Baptiste de Rouville.
Lamy, Eucharistе.....St-Sévère, St Maurice.
Larose, Bruno.....Ste-Théodosie de Verchères.
Lacaillarde, Louis.....Eastman.
Labelle, Rev. M. A.....Quebec.
Langevin, Apollinaire.....Milton.
Lortie, Honoré.....Quebec.
Lussier, P. A.....St.Damase.
Laliberté, Edmond.....St-Valérien de Shefford.
Lambert, Joseph.....St-Joseph de Beauce.
Labonté Rev. M. Octave.....Ste-Thérèse.
Letiecq, Albert.....Moncton, (N. B)
Lemire, Louis.....La Baie du Febvre.
Lord, Aimé.....Portneuf.
Lafontaine, E.....St-Hugues.

Legris, J. H.....Louiseville.
Létourneau, Camille.....Ste Madeleine.
Lecomte, E.....Nicolet.
Laplante, W. R.....Ste-Hélène.
Leblanc, Adelmar .....St-Jacques lAchigan.
Leclerc, J. Damien .....Ste-Thérèse.
Leclerc, Hector L.....Ste-Thérèse de Blainville.
Lacoursière, Ovide.....St-Laurent. (Lake Manitoba)
Lapointe, Ludger.....La Malbaie.
Laberge, J. O .....Yamachiche.
Latour, Ch.....St Rémy.
Labelle, Louis.....St-Jérôme.
Lacroix, Louis.....Mirabel.
Legendre, G. H .....St-Flavien.
Lafond, Stanislas.....Ste Scholastique.
Lafontaine, Maxime .....St-Ephrem d'Upton.
Lacombe, Olivier.....St-Hilaire.
Lacourse, Jos.....St-Barthélemy.

M

Marsan, Arthur.....St-Valérien.
Montminy, Rev. M.....St-Georges de Beauce
Marsan, Cléophas.....St-Valérien.
MacDonald, Milton.....Acton-Vale.
Mireault, Azarie.....St-Jacques de l'Achigan.
Marsan, J. J. A.....L'Assomption.
Marion, Joseph.....St-Jacques de l'Achigan.
Milot, Léonard.....St-Léon de Maskinongé.
Marion, Edmond.....St-Gabriel de Brandon.
Magnan, Médéric.....St-Alexis de Montcalm.
Martel, Charles.....Baie St-Paul.
Marchand, Onésime.....Ste-Geneviève, Batiscan.
Mackie, John.....Birchton.
Marcotte, Elzéar.....Portneuf.
Magnan, Gédéon.....L'Epiphanie.
Marsolais, Eugène.....L'Assomption.
Mousseau, A.....Berthier.
McColl, Hugh.....St-Joseph, Deux Montagnes.
Marquis, F. X.....St-Justin, Dorchester.
Magnan, Octave.....St-Alexis de Montcalm.
Milot, Charles.....Ste-Monique de Nicolet.
Marchessault, Z. T.....St-Damase.

Magnan, Raymond.....Berthier. en haut.
Martel, Eusèbe.....St-Célestin.
Mahoney, Michael.....Ste-Marthe, (Vaudreuil).
Mailhot, Elzéar.....Arthabaskaville.
Massé, Pierre.....Rivière Ouelle.

N

Nicole, Alphonse.....St-Simon de Rimouski.
Normandin, Toussaint.....St-Pie.
Naud, Albert .....St-Alban.
Normandin, W.....Roxton Pond.

O

O'Haviland, Jos..... .....Ste-Catherine de Hatley
Ouellette, Romuald.....St-Apollinaire.

P

Préfontaine, Fulgence.....Durham-South.
Painchaud, Jos.....Tingwick.
Poirier, H.....Roxton Falls.
Plante, F. X .....St-Frédéric, Beauce.
Paré, Camille Elie.....St-Vincent de Paul.
Péloquin, Charles.....St-Hyacinthe.
Pelletier, J. A.....Rivière Ouelle.
Plamondon, Ignace.....St-Raymond, Portneuf.
Painchaud, Dr. C. F.....Varennes.
Paquin, Moïse.....Maskinongé.
Poulin, Etienne.....St-Germain de Grantham.
Provancher, l'abbé.....Cap-Rouge.
Pépin, Jos. Noë.....St-Joachim.
Pelletier, Alphonse.....St-Roch des Aulnais.
Payette, J. B.....St Denis.
Pratte, Benjamin.....Wotton.
Perron, Antoine.....Saint-Fidèle.
Pelletier & Bélanger.....St-Ferdinand d'Halifax.
Préfontaine, Charles.....L'Isle Verte.
Poirier, J. A.....St-Grégoire de Nicolet.
Préfontaine, A.....L'Isle Verte.
Paquet, Jules N.....St-Nicolas.
Pacaud, Hon. Ed.....Arthabaskaville.
Paquet, J. B..... .....St-Charles de Bellechasse.
Painchaud, Henri.....Kingsey, French village.

Pelletier, Auguste.....St-Roch des Aulnais.
Petit, Ludger.....St-Hélène de Bagot.
Pitre, Telesphore.....St-Isidore de Laprairie.
Proulx, F. X.....St-Raymond.
Paradis, Alexandre.....St-Elzéar de Beauce.
Préfontaine & Frère.....L'Isle Verte.
Pelletier, Joseph.....St-Roch des Aulnais.
Proulx, Cleophas.....La Baie du Febvre.
Philibert, Désiré.....St Justin.
Philibert, Salomon.....St-Justin.

R

Robillard, Félix.....St-Ours.
Roger, Télesphore.....St-Agapit de Beaurivage.
Racine, Charles.....St-Pie.
Roy, Emile P.....Se-Pie.
Russell, E. A.....North- Stanbridge.
Roy & Boucher.....Coaticook.
Roy, Vital.....St-Joseph de Beauce.
Richard, Geo.....Ste-Claire. Dorchester.
Rochette, Phidime.....St-Augustin de Portneuf.
Rhodes, Hon. Col. W. E.....Quebec,
Rocheleau, Jos.....St-Basile-le-Grand.
Ross, Hon. J. J.....Ste-Anne de la Pérade.
Richard, J. B.....St-Liguori.
Ritchie, A. N.....St-Anne de la Pérade.
Rhault, J. B.....Bécancour.
Robillard, P. A.....St François du Lac.
Rouleau, Emile.....Ste-Hénédine de Dorchester.
Roy, Fortunat.....Coaticook.
Robert, E.....St-Valérien.
Robert, M.....do

S

Sicard, Antoine.....Ste-Hélène.
St-Pierre, Ludger.....Ste-Brigide.
Simard, B. A. Roch.....L'Assomption.
Sylvestre, Elie.....St-Théodore d'Acton.
St-Laurent, Cyrille.....St-Valère Bulstrode (Artha.)
St-Pierre, Isidore.....La Présentation.
Simoneau, Alexandre.....St-Zéphirin de Courval.

T

Taché, Henri.....St-Hyacinthe.
Taché, J. de L.....Québec.
Trudel, Alfred.....St-Prosper de Champlain.
Toupin, Louis.....St-Hugues.
Trappistes, Rév. Pères.....Oka, (Deux-Montagnes)
Thibault, Louis.....Woodside, (Meg.)
Trudel, Philippe.....Ste-Geneviève de Batiscan.
Tremblay, Charles.....Chicoutimi.
Tranchemontagne, Louis.....Berthier.
Tanguay, Dr. G. Ph.....St-Gervais, Bellechasse.
Turgeon, F. D.....East Broughton.
Tremblay, David.....St-Joseph d'Alma.
Thibaudeau, J. B.....Quebec.
Toussignant, Napoléon.....St-Norkert d'Arthabaska.
Truchon, François.....Matane.
Taschereau, Antoine.....Ste-Marie de Beauce.

V

Vigneau, J. B.....La Baie du Febvre.
Veilleux, Philias.....St-Victor de Tring.
Vadnais, Joseph.....St-Pie.
Vadnais, Henri.....St-Guthbert.
Venne, Salomon.....St-Jacques de Montcalm.
Vigeant, Frs.....N. D. de Stanbridge.
Vaillancourt, Jos. A.....Montreal.
Vincelette, Michel.....Valcourt d'Ely.
Vadboncœur, Odillon.....Boulogne.

W

Waddell, J. B.....Ste-Thérèse.
Wilson, W.....St-Justin.

RE

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RECEIPTS AND EXPENDITURE

OF THE ASSOCIATION FOR THE YEAR 1889.

RECEIPTS.

Grant to the Association	$1000.00
Grant to the school-factory	300.00
Members' subscriptions	366.00
Sale of reports	1.75
From people visited	0.00
Divers sums	96.50
Balance on hand, 1888	122.52
	1886.77

EXPENDITURE.

Printing	$289.75
Stationery, postage, &c	79.56
Directors' travelling expenses, &c	113.29
Grants and expenses of the meeting	237.58
Secretary-treasurer's salary	200.00
Inspector's salary	400.00
Grant to school-factory	300.00
Travelling expenses, in connection with school-factory, teaching, &c	234.44
Prizes for the competition	40.00
Purchase of books, subscriptions, &c	0.00
Extraordinary expenses	89.78
Total	1934.40
Receipts	1886.77
Balance due to the Secretary-Treasurer	$47.63

REPORT OF THE AUDITORS

After having examined the above accounts in detail. we declare them to be correct.

ARTHABASKAVILLE, December 11th, 1889.

(Signed) Ad. BRUNEAU,

" F. PREFONTAINE.

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