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NINTH REPORT 92374
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DAIRYMEN'S ASSOCIATION

— OF THE —

PROVINCE OF QUEBEC.

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

1890.

PRINTED BY ORDER OF THE LEGISLATURE.



QUEBEC:
PRINTED BY CHARLES FRANCOIS LANGLOIS

PRINTER TO HER MOST EXCELLENT MAJESTY THE QUEEN.

1891.

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CONSTITUTION OF THE DAIRYMEN'S ASSOCIATION

Officers and Directors of the Dairymen's Association

NINTH 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 1890, and of the Annual Meeting held at Sorel, the 26th and 27th of November last.

THE SECRETARY-TREASURER OF THE DAIRYMEN'S

ASSOCIATION OF THE PROVINCE OF QUEBEC,

J. DE L. TACHÉ.

Quebec, Jan. 2nd, 1891.

Officers and Directors of the Dairymen's Association

FOR 1891.

Honorary President: THE HON. P. B. DE LABRUERE, St. Hyacinthe.

President: M. N. BERNATCHEZ, M.P.P., Montmagny.

Vice-President: L'ABBÉ T. MONTMINY.

Secretary-Treasurer: J. DE L. TACHÉ, Quebec.

DIRECTORS:

Arthabaska	T. C. CARTIER	Kingsey-French-Village
Beauce	PHILIAS VEILLEUX	St. François-Beauce.
Beauharnois	D. M. MACPHERSON	Lancaster, Ont.
Bedford	S. A. FISHER, M.P.	Knowlton.
Charlevoix	CHAS. MARTEL	La Baie St. Paul.
Chicoutimi et Saguenay	PAUL COUTURE, M.P.	Quebec.
Iberville	O. BERGERON	St. Athanase.
Joliette	I. J. A. MARSAN	L'Assomption.
Kamouraska	J. C. CHAPAIS	St. Denis-en-bas.
Montmagny	N. BERNATCHEZ	Montmagny.
Montreal	ALEXIS CHICOINE	St. Marc.
Quebec	L. P. BERNARD	Cap Santé.
Richelieu	DR. AD. BRUNEAU	Sorel.
Rimouski	A. NICOLE	St. Simon de R.
St. François	J. E. PLAMONDON	Wotton.
St. Hyacinthe	L. T. BRODEUR	St. Hugues.
Terrebonne	FRS. DION	Ste. Thérèse.
Three Rivers	L'ABBÉ D. GÉRIN	St. Justin.

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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 efficiency, 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 month beforehand.

2. At the request of three directors or officers of the association, the president may call a general meeting of the board of directors; 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 determined 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.

8. When more than one candidate is proposed for the same office, the voting shall be by ballot and the secretary shall count the votes and the president shall declare the candidate who shall have the majority of votes.

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

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

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

12. 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.

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LEGISLATION.

REVISED STATUTES, QUEBEC, SEC. XIII.

DAIRY ASSOCIATION OF THE PROVINCE OF QUEBEC.

1749. The Lieutenant-Governor in Council may authorise the formation for the Province of an association, having for its object to promote improvement in the manufacture of butter and cheese, and of all things connected therewith, under the name of the "Dairy Association of the Province of Quebec," 45 v., c. 66, S. 1.

1750. The association shall be composed of at least fifty persons, who shall sign a declaration in the form of the schedule annexed to this section; and every member of the association shall subscribe and pay, annually, a sum of at least one dollar to the funds of the association.

The Commissioner of Agriculture and Colonisation shall be *ex-officio*, a member of the association, 45 v., c. 66, ss. 2 and 6; 50 v., c. 7, s. 12.

1751. Such declaration shall be made in duplicate, one to be written and signed on the first pages of a book to be kept by the association for the purpose of entering therein the minutes of their proceedings, during the first year of the establishment of such association, and the other shall be immediately transmitted to the Commissioner of Agriculture and Colonisation, who shall, as soon as possible after its reception, cause to be published a notice of the formation of such society in the Quebec Official Gazette, 45 v. c. 66, s. 3; 50 v. c. 7, s. 12.

1752. From and after the publication, in the Quebec Official Gazette, of the notice of the formation of the association, it will become and shall be a body politic and corporate, for the purposes of this section, and may possess real estate to a value not exceeding twenty thousand dollars, 45 v., c. 66, s. 4.

1753. The association shall have power to make by-laws, to prescribe the mode or manner of admission of new members, to regulate the election of its officers, and, generally, the administration of its affairs and property, 45 v., c. 66, s. 5. (1)

54 VICT., 1890, CAP. XX.

AN ACT TO AMEND THE LAW RESPECTING THE INDUSTRIAL DAIRY ASSOCIATION OF THE PROVINCE OF QUEBEC.

(Assented to 30th December, 1890)

Whereas, under the provisions of article 1749 of the Revised Statutes, the Industrial Dairy Association of the Province of Quebec was organised;

Whereas the said association has recommended the formation of syndicates for the purpose of securing a more prompt and complete diffusion of the best

(1) Articles 1753 *a*, *b*, *c*, *d*, and *e*, were added to the charter of the association, by chap. xx, passed last session, which received assent on December 30th, and is given below. In the course of the report, our readers will find the discussion that took place at Sorel on the proposed syndicates of factories, and at the end of the report, every information regarding their working.

methods to be adopted for the production of milk, the fabrication of dairy produce and in general the advancement of the dairy industry;

And whereas the said recommendation was approved by the Committee on Agriculture and Colonization in a report which was adopted, by the Legislative Assembly, on the 23rd December instant;

Therefore, Her Majesty, by and with the advice and consent of the Legislature of Quebec, enacts as follows:

1. The following articles are added after article 1753 of the Revised Statutes of the Province of Quebec:

"1753a. The association, with a view of obtaining a more prompt and complete diffusion of the best method to be followed for the production of milk, the fabrication of dairy produce and, in general, the advancement of the dairy industry, may subdivide the Province into regional divisions, in which syndicates, composed of proprietors of butter and cheese factories and other like industries, may be established.

The formation and working of such syndicates are governed by the regulations made by the said Association and approved by the Lieutenant-Governor in Council; and such syndicates shall be under the direction and supervision of the Association.

To such syndicates, the Lieutenant-Governor in Council may grant, out of the Consolidated Revenue Fund, a subsidy equal to one half of the expenses incurred for the service of inspection and instruction organized therein, including the salary of inspectors their travelling and other expenses directly connected therewith, but not to exceed the sum of two hundred and fifty dollars for each syndicate.

"1753b. The inspectors, including the Inspector General, are appointed by the Lieutenant-Governor in Council, and shall be experts who hold certificates of competence from the board of examiners mentioned in article 1753d.

The inspectors are to superintend the production and supply of milk, as well as the manufacture of butter and cheese in the establishments so organized into such syndicates, the whole in conformity with the regulations made by the said Association and approved by the Lieutenant-Governor in Council.

"1753c. The salary of the Inspector General shall be paid by the Association.

His duties shall be defined by regulations to be passed by the Association and approved by the Lieutenant-Governor in Council.

"1753d. A board of examiners may be appointed by the Association for the purpose of examining candidates for the office of inspector.

The working of such board shall be governed by the regulations to be passed for that purpose by the Association and approved by the Lieutenant-Governor in Council.

"1753e. It shall be lawful for the Lieutenant-Governor in Council to grant to the said society an additional sum of one thousand dollars, annually, for the direction and supervision of the syndicates, and for the maintenance and working of the boards of examiners above mentioned."

2. This act shall come into force on the day of its sanction.

1754. The association shall hold an annual meeting, at such time and place as shall have been selected by the board of directors, besides those which may have been prescribed and determined by the by-laws.

At such annual meeting, the association shall elect a president, and vice-president, a secretary-treasurer, and also one director for each judicial district of the Province, chosen from among the members of the association domiciled in such districts, 45 v., c. 66, s. 7.

1755. The officers and directors of the association shall prepare and present, at the annual meeting of the association, a detailed report of their operations during the past year, indicating the names of all the members of the association, the amount subscribed and paid by each, the names of the factories, inventions, improvements and products which deserve public notice, and giving all the information which they deem useful in the interest of the dairy industry, 45 v., c. 66, s. 8

SCHEDULE

MENTIONED IN ARTICLE 1750.

We, the undersigned, agree to form ourselves into an association under the provisions of section thirteenth of chapter seventh of title fourth of the Revised Statutes of the Province of Quebec, respecting the Dairy Association of the Province of Quebec; and we hereby, severally, agree to pay to the treasurer, annually, while we continue members of the Association, the sums opposite to our respective names and we further agree to conform to the rules and by-laws of the said Association.

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45 V., c. 66, Schedule.

52 VICT., 1889, CAP. XXII.

AN ACT TO PROVIDE FOR THE FORMATION OF FARMERS' AND
DAIRYMEN'S ASSOCIATIONS.

(Assented to 21st March, 1889.)

HER MAJESTY, by and with the advice and consent of the Legislature of Quebec, enacts as follows:

1. The following section is added after section thirteenth of chapter seventh of title fourth of the Revised Statutes of the Province of Quebec:

SECTION XIV.

FARMERS' AND DAIRYMEN'S ASSOCIATIONS.

" 1755a. The Lieutenant-Governor in Council may authorise the formation, in each judicial district of the Province, of an association, having for its object the promotion of agriculture, the improvement in the manufacture of butter and cheese, the inspection of butter and cheese factories, and all other things in connection therewith, to be called the "Farmers' and Dairymen's Association of the District of "

" 1755b. The association shall be composed of at least twenty-five persons, who shall sign a declaration in the form of the schedule annexed to this section.

Every member of the association shall subscribe and pay, annually, a sum of at least one dollar to the funds of the association.

" 1755c. The Commissioner of Agriculture and Colonisation shall be *ex-officio* a member of the association.

" 1755d. Such declaration shall be made in duplicate, one to be written and signed on the first pages of a book, to be kept by the association for the purpose of entering therein the minutes of their proceedings, and the other shall be immediately transmitted to the Commissioner of Agriculture and Colonisation, who shall, as soon as possible after its reception, cause to be published a notice of the formation of such association in the Quebec Official Gazette.

1755e. From and after the publication in the Quebec Official Gazette of the notice of the formation of the association, such association will become and shall be a body politic and corporate, for the purposes of this section, and may possess real estate to the value not exceeding five thousand dollars.

" 1755f. The association shall have power to make by-laws, to prescribe the mode or manner of admission of new members, to regulate the election and appointment of its officers and employés, and generally the management of its affairs and property for the purpose of carrying out the objects of the association.

" 1755g. The first meeting of the association shall be held at the *chef-lieu* of the district, on the second Wednesday of the month following the one

R. S. Q., TITLE XI, CAP. IV, SECT. III.

SOCIETIES FOR THE MANUFACTURE OF BUTTER OR CHEESE OR OF BOTH.

§ 1.—*Formation of such Societies.*

5477. When, in any part of the Province, five or more persons have signed a declaration, that they have formed an association for the manufacture of butter or cheese (or of both, as the case may be) in a certain place which shall be designated as their principal place of business, and have deposited such declaration in the hands of the prothonotary of the Superior Court in the district where the society intends to do business, such persons and all such other persons as may thereafter become members of such society, their heirs, executors, curators, administrators, successors and assigns, respectively, shall constitute a body politic and corporate, under the name of the "butter and cheese manufacturing society (or both, as the case may be) of (name of the place and number of the manufactory as mentioned in the declaration)."

The prothonotary shall deliver to such company a certificate, stating that such declaration has been made, which certificate shall be registered in the registry office of the place where such society has its principal place of business, and be also, without delay, forwarded to the Commissioner of Agriculture and Colonisation, 45 V., c. 65, s. 1; 50 V., c. 7, s. 12.

5478. The declaration, to be made under the provisions of this section, shall, in order to constitute into a corporation any butter and cheese manufacturing society, be in the form annexed to this section, 45 V., c. 65, s. 9.

§ 2.—*General Powers and Duties.*

5479. Every such society so formed, for the purposes for which it has been established, shall enjoy all the powers vested in ordinary corporations, especially that of choosing officers from among its members, of passing by-laws, not contrary to the laws of this Province, to determine the number of its members, the amount of its shares and the mode of levying the same, for the internal management and for conducting its proceedings and the administration of its affairs in general, 45 V., c. 65, s. 2.

5480. The first meeting of the shareholders of the society shall take place, within the eight days following the deposit of the declaration mentioned in article 5477, after a special notice to that effect has been given to the shareholders, by at least two shareholders of the said society, which notice shall be given at least two days before the meeting for the purpose of electing officers and approving the by-laws of the society.

The annual general meetings afterwards and all special meetings of the society shall be regulated by by-law, 45 V., c. 65, s. 3.

5481. A book shall be kept by each society for entering the subscriptions of shares, and another for entering in detail all the transactions of the society, 45 V., c. 65, s. 4.

5482. Each of such books and the by-law shall be constantly open to the inspection of the members of the society, 45 V., c. 65, s. 5.

5488. During the course of the month of December in each year, a statement of its operations for the year shall be forwarded to the Commissioner of Agriculture and Colonization by each society formed under this section, 45 V., c. 65, s. 7; 50 V., c. 7, s. 12.

49 VICT., CAP. XLII, 1886, OTTAWA.

AN ACT TO PROHIBIT THE MANUFACTURE AND SALE OF CERTAIN SUBSTITUTES FOR BUTTER.

(Assented to 2nd June, 1886.)

Whereas the use of certain substitutes for butter, heretofore manufactured and exposed for sale in Canada, is injurious to health; and it is expedient to prohibit the manufacture and sale thereof: Therefore Her Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:

1. No oleomargarine, butterine or other substitute for butter, manufactured from any animal substance other than milk, shall be manufactured in Canada, or sold therein, and every person who contravenes the provisions of this Act in any manner whatsoever, shall incur a penalty not exceeding four hundred dollars, and not less than two hundred dollars, and in default of payment shall be liable to imprisonment for a term not exceeding twelve months and not less than three months.

52 VICT., CAP. XLIII, 1889, OTTAWA.

AN ACT TO PROVIDE AGAINST FRAUDS IN THE SUPPLYING OF MILK TO CHEESE, BUTTER AND CONDENSED MILK MANUFACTORIES. (1)

(Assented to 2nd May, 1889.)

Her Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:—

1. No person shall sell, supply or send to any cheese, or butter, or condensed milk manufactory, or to the owner or manager thereof, or to any maker of butter, cheese or condensed milk, to be manufactured, milk diluted with water, or in any way adulterated, or milk from which any cream has been taken, or milk commonly known as skimmed milk.

2. No persons who supplies, sends, sells or brings to any cheese, or butter, or condensed milk manufactory, or to the owner or manager thereof, or to the maker of cheese, or butter, or condensed milk, any milk to be manufactured into butter, or cheese, or condensed milk, shall keep back any portion of that part of the milk known as strippings.

(1) The Ontario courts have declared to be *ultra vires*, an act of legislature on the same subject like that which exists in our Provincial Statutes. The Federal Act was passed subsequently to this judicial decision, and all prosecutions regarding frauds in the furnishing of milk, should, as a measure of prudence, be instituted in virtue of this Act.

3. No person shall knowingly sell, supply, bring or send to a cheese, or butter, or condensed milk manufactory, or to the owner or manager thereof, any milk that is tainted or partly sour.

4. No person shall sell, send or bring to a cheese or butter, or condensed milk factory, or to the owner or manager thereof, or to the maker of such butter, or cheese, or condensed milk, any milk taken or drawn from a cow that he knows to be diseased at the time the milk is so taken or drawn from her.

5. Every person who, by himself or by any other person to his knowledge, violates any of the provisions of the preceding sections of this Act, shall, for each offence upon conviction thereof before any justice or justices of the peace, forfeit and pay a fine not exceeding fifty dollars and not less than five dollars, together with the costs of prosecution, and in default of payment of such penalty and costs, shall be liable to imprisonment with or without hard labor for a term not exceeding six months, unless the said penalty and the costs of enforcing the same, be sooner paid.

6. The person on whose behalf any milk is sold, sent, supplied or brought to a cheese, or butter, or condensed milk manufactory for any of the purposes aforesaid, shall *prima facie* be liable for the violation of any of the provisions of this Act.

7. For the purpose of establishing the guilt of any person charged with the violation of any of the provisions of sections one, or two of this Act, it shall be sufficient *prima facie* evidence on which to found a conviction to show that such milk so sent, sold, supplied or brought to a manufactory as aforesaid to be manufactured into butter, or cheese, or condensed milk, is substantially inferior in quality to pure milk, provided the test is made by means of a lactometer or cream gauge or some other proper and adequate test, and is made by a competent person: Provided always, that a conviction may be made or had on any other sufficient legal evidence.

8. In any complaint or information made or laid under the first or second sections of this Act, and in any conviction thereon, the milk complained of may be described as deteriorated milk, without specification of the cause of deterioration, and, thereupon, proof of any of the causes or modes of deterioration mentioned in either of the said two sections, shall be sufficient to sustain conviction. And in any complaint information or conviction under this Act, the matter complained of may be declared, and shall be held to have arisen, within the meaning of "The Summary Convictions Act," at the place where the milk complained of was to be manufactured, notwithstanding that the deterioration thereof was effected elsewhere.

9. No appeal shall lie from any conviction under this Act except to a Judge of a Superior, County, Circuit or District Court, or to the chairman or judge of the Court of the Sessions of the Peace, having jurisdiction where the conviction was had; and such appeal shall be brought, notice of appeal in writing given, recognizance entered into or deposit made within ten days after the date of conviction, and shall be heard, tried, adjudicated upon and decided without the intervention of a jury, at such time and place as the court or judge hearing the same appoints, within thirty days from the date of conviction, unless the said court or judge extends the time for hearing and

decision beyond such thirty days ; and in all other respects not provided for in this Act the procedure under "The Summary Convictions Act," so far as applicable, shall apply.

10. Any person accused of an offense under this Act, and the husband or wife of such person, shall be competent and compellable to testify.

11. Any pecuniary penalty imposed under this Act shall, when recovered, be payable one-half to the informant or complainant, and the other half to the owner, treasurer or president of the manufactory to which milk was sent, sold or supplied for any of the purposes aforesaid, in violation of any of the provisions of this Act, to be distributed among the patrons thereof in proportion to their respective interests in the product thereof.

The meeting of the Dairywomen's Association of 1907 - 1908 was held at the Town Hall on Wednesday and Thursday of the 27th and 28th of November, 1907. The meeting was held at the Town Hall on Wednesday and Thursday of the 27th and 28th of November, 1907. The meeting was held at the Town Hall on Wednesday and Thursday of the 27th and 28th of November, 1907.

EXTRACT FROM THE "HERRING" OF NOVEMBER 28TH, 1907.

The meeting of the Dairywomen's Association of 1907 - 1908 was held at the Town Hall on Wednesday and Thursday of the 27th and 28th of November, 1907.

We are happy to state that a truly and a brilliant success has crowned the annual meeting of the Dairywomen's Association of the Province of Quebec, held at Quebec on Wednesday and Thursday of the 27th and 28th of November, 1907.

The audience, composed of distinguished agriculturists and zealous friends of farming from all parts of the country was numerous throughout the two days and the lectures, the reports of the inspectors, and the discussions were deeply interesting.

Many thanks of the city, among whom was Mrs. Isabelle, the deputy minister of agriculture, honoured this meeting with their presence, thereby that in our province the agricultural class can reckon upon the zeal and devotion of these bonnie dames, who have always been the best friends of the Canadian farmer.

The presence of several members of the federal parliament and of the provincial legislature, as well as of a good number of other persons belonging to the liberal professions has once more demonstrated the interest that the governing classes take in agricultural questions, and is particularly adapted to extirpate any possible remains of the prejudice that formerly existed among farmers against educated men.

Moreover we have been favoured all the time with superb weather which is by no means an unjustly to great public meeting.

On Wednesday morning the day of the opening of the convention, a unusual degree of animation pervaded the town. Strangers filled the streets and hotels, and flags were flying above the public buildings as well as over many private residences and houses of business.

In the forenoon the officials and directors of the Dairywomen's Association met at the Town Hall to arrange the programme of the convention and to decide upon some other details.

EXTENDED REPORT

OF THE ANNUAL MEETING OF THE DAIRYMEN'S ASSOCIATION, HELD AT SOREL,
THE 26TH AND 27TH NOVEMBER, 1890.

Preliminary Note.—In our reports for the last few years, we have classified the subjects therein treated; but this method having almost invariably caused delay, we have decided this year to follow the order of the shorthand report. The report will close with a table, more elaborate than usual, by means of which it will be easy to find in the body of the work everything connected with any particular subject, or what has been said by any one person. We request our readers to take notice of the preceding.

(EXTRACT FROM THE "SORELOIS," OF NOVEMBER 28TH, 1890.)

The meeting of the Dairymen's Association at Sorel.—Brilliant success.

"We are happy to be able to state that a thorough, even a brilliant success, has crowned the ninth annual meeting of the Dairymen's Association of the Province of Quebec, held at Sorel, on Wednesday and Thursday of this week.

The audience, composed of distinguished agriculturists and zealous friends of farming from all parts of the country was numerous throughout the two days, and the lectures, the reports of the inspectors, and the discussions were deeply interesting.

Many members of the clergy, among whom was Mgr. Labelle, the deputy minister of agriculture, honoured this meeting with their presence, proving thereby that in our province the agricultural class can reckon upon the zeal and devotion of these hommes d'élite, who have always been the best friends of the Canadian farmer.

The presence of several members of the federal parliament and of the provincial legislature, as well as of a good number of other persons belonging to the liberal professions, has once more demonstrated the interest that the governing classes take in agricultural questions, and is particularly adapted to extirpate any possible remains of the prejudices that formerly existed among farmers against educated men.

Moreover, we have been favoured all the time with superb weather, which is by no means an injury to great public meetings.

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About half-past one p.m., an address of welcome was presented to the members of the Association by his Honour the Mayor, M. Taillon.

The ceremony took place in the Council Chamber of the Town Hall. So great was the crowd, that hundreds were unable to enter the chamber.

After a selection of music, brilliantly executed by our band, under the direction of M. Boulais, the mayor, surrounded by the aldermen, the members of the Chamber of Commerce, and many other citizens, read the following address:

To the President and Members of the Dairymen's Association of the Province of Quebec.

MR. PRESIDENT AND GENTLEMEN,

Permit me, in the name of my fellow-citizens, to offer you the most cordial welcome, and to request your acceptance of the hospitality of our town.

You have conferred a great honour upon us in accepting our invitation to hold the annual meeting of your Association at Sorel this year.

Moreover, we have learned that you are, before all things, practical men, and that, entrusted with the direction of a scientific Association, your brief stay among us must be devoted to the study of questions too important to leave you much leisure time.

The chief end of your Association is to encourage the improvement of the manufacture of butter and cheese, and of all things thereunto attached.

This is an aim of very great public interest, the attainment of which has produced, and will continue to produce, immense benefits for all those who devote themselves to this industry, which is worthy of being called a national industry, since it is one of the most important in the country.

Besides the general interest which your deliberations will create, they will be productive of benefits to our friends the farmers of this district, who, a great number of them, at least, will most particularly profit by the advantage of listening to the learned essays of *agronomes* who have distinguished themselves in agricultural science.

These discussions, the fruit of earnest studies united to extensive experience, are fitted to contribute to the development of agriculture, and to give a fresh impulse to this leading element of our national wealth.

Canada may well be proud of its enviable position as a commercial centre. Its railroads, its shipping and canals, its agricultural lands, its mines, are so many sources of wealth, of which we must know how to make good use; but it is also important to devote special study to the means of most advantageously attaining the desired end. It is for economists and specialists to investigate separately each of these subjects; your duty, gentlemen, is to devote yourselves to the questions concerning agriculture.

The development, then, of the industry you represent is the development of the prosperity of the nation.

In contributing to it you are devoting yourselves to an eminently patriotic work, and the gratitude of the whole country is, without doubt, your due.

In my opinion, Government might show you its gratitude by increasing the grant you at present receive. This would be one way of extending the usefulness, the reputation, and the importance of the association; of imparting to it still more energy, and of putting it into a condition to arrive more rapidly at its object.

The Federal Government has just received from Europe an official notice announcing that the Canadian cheese is the best imported from all the countries of the world, and that the highest prizes were awarded to it at the last exposition held in London.

I think, gentlemen, that you may take credit to yourselves of having been the cause of a great part of this grand success, and you will allow us to offer you our congratulations upon it.

Be persuaded, gentlemen, that during the short time you remain in Sorel we shall do all in our power to render your stay among us as pleasant as possible.

A. A. TAILLON,
Mayor of the City of Sorel.

SOREL, 26th November, 1890.

The warm applause that emphasised several passages in this address, proved that the Mayor was a faithful interpreter of the feelings of his constituents (*administrés*).

The band, then, played again; after which M. Bernatchez, M.P.P. for Montmagny, and president of the Dairymen's Association, replied fully and with much feeling to this address, in the midst of frequent and earnest applause, with which mingled the roar of the cannon which had never been silent during the whole ceremony.

M. l'abbé Decelles, the curé of Sorel, who was present, was then invited to address the meeting, which he did in a short *ex tempore* speech, as witty as it was eloquent, and which was received with lively acclamations.

REPLY OF THE PRESIDENT OF THE ASSOCIATION.

Mr. Mayor and Messrs. the Councillors of Sorel:

I must begin with finding fault with you; had you given me notice of the splendid reception you were preparing for us, I should have perhaps been able to prepare a more worthy reply to your address.

I believe I am expressing the feelings of all those who are present in this magnificent meeting when I thank you for your kindly welcome and for the hospitality which you offer us with so much grace and earnestness.

I may add that if we have done you much honour in holding this convention in your city, it is with pleasure that we have come to visit this lovely town. It is the first time I have seen it; I am enchanted with it, and I beg to compliment you on it. The merit of our visit is due, in great part, to your

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excellent colleague, Dr. Bruneau, one of the directors of this association, who did his best to induce us to hold our meeting here.

The aim of our association is to encourage and improve the manufacture of butter and cheese. It has been now ten years in existence, and this is our ninth convention. Ten years ago, the association began its labours under the auspices of my predecessor in the president's chair, whom I regret more than ever on the present occasion. He could have done honour to the position, while I, I tell you frankly, had I expected to be the object of such a grand reception, should have declined the honour of presiding here, so much do I feel myself unable to discharge the duties of the position.

He whom I have succeeded was indeed the very man to reply appropriately to the address you have just presented to us. Still, as you said, our association being above all things practical, I felt myself obliged, as a practical man, to accept the honour with which I was complimented, and I trust that this quality of being practical will contribute to win my pardon for any faults I may commit on the present occasion. When one is absorbed in the material necessities of existence, it is impossible to cultivate the superior faculties of the intellect.

To this province the dairy industry has been productive of much good, and it is called upon to extend greatly its service in the future. Thanks to the zeal which is everywhere arrayed in its support, thanks to the encouragement it receives, thanks to the skilful guidance bestowed upon it—not by me, but by our indefatigable secretary, M. Taché—it cannot fail to prosper.

Our deliberations will be fruitful for your friends the farmers of this district. It cannot be otherwise. When one sees so great a number of persons assembled in this spacious hall, one is satisfied of the interest which these deliberations excite.

Very important matters will be discussed in this meeting; matters that cannot fail to interest you, and a knowledge of which will contribute to the advancement and prosperity of the country.

Your town has the good fortune, to-day, of having been selected out of a great number of applicants for the seat of this convention; well, gentlemen, your zeal will be repaid by the profit you will reap from the lectures you are about to listen to.

No doubt, in an agricultural district like this, situated near the great centres of population, farming must be in an advanced condition; but in agriculture, even when much has been done, still more remains to do. Now that science has added its aid to agriculture, now that it affords to farmers its most powerful assistance to investigation, we may look forward to a day, not far off, when we shall see a radical alteration in the condition of the Province of Quebec.

You said that Canada should be proud of her position in the world. Yes, Mr. Mayor, I agree with you; Canada is a fine country; and especially, a fine farming country. I have not travelled much, it is true, but nowhere have I found a soil so fine as in the Province of Quebec. Our soil is fertile. True, our season of vegetation is not very long; but the fertility of the soil compensates for this inconvenience, by the rapid ripening of the crops it produces.

You will meet here distinguished men, members of the clergy, who leave their homes to lend you their most earnest assistance. So much zeal and devotion must inspire us with confidence in the future of our country. Here, you see the authorities of the town, and numbers of its citizens, who, by their presence, increase the lustre of this convention.

I said just now that government might increase the grant made to the Dairymen's Association. Hitherto, I have employed to this end the little influence I possess, and, on this important occasion, permit me to declare that in the future, as in the past, I shall devote all my energy and intellectual power to assist, as far as in me lies, the views of the Dairymen's Association.

I will do all I possibly can to obtain sufficient funds to enable us to put in practice the ideas conveyed in the speeches of our able lecturers. I am confident, gentlemen, that we shall succeed in our purpose. For my part, I know that the Premier of Quebec, who is at the head of the department of Agriculture and Colonisation, is very favourably inclined towards the dairy industry; and, this evening, you will have the advantage of having among you the Deputy Minister of Agriculture and Colonisation, Monsignor Labelle, who once more will seek to renew your courage, and to convince himself of the advisability of promoting the views of this association.

Government has receive from Europe the news that Canadian cheese has obtained the highest prizes at the London dairy show. This is a grand result; we are proud of it, but we must also try to justify our success. We must not rest satisfied with the compliments we receive, but we must strive to deserve them by improving our manufacture: it is good, but not yet perfect.

There is no doubt about Canadian cheese being appreciated. A few weeks ago, I had the pleasure of a visit from a member of an important firm, in the butter and cheese line, at Liverpool. He had come to Canada for the purpose of meeting our dealers, and trying to obtain from them sufficient consignments of Canadian cheese to supply his trade. The Americans, he told me, send a great deal of cheese to England, but much of it comes through Canada in order to pass for Canadian. This person, then, came to gain information *de visu*, and he hopes to get enough consignments to enable him to cease entirely buying American cheese, which, said he, with few exceptions, is inferior to the Canadian.

I am very sensible of the kindness you express in the close of your address, when you say that you will do your best to make our stay among you agreeable to us. We knew that beforehand: the kind greeting that met us on our arrival, was a pledge of the treatment we might expect during the remainder of the time we had to pass in your town.

Once more I thank you heartily, and I trust you will excuse the clumsiness of this *ex tempore* address.

You said that Canada should be proud of her position in the world. I agree with you; Canada is a fine country; and especially a fine farming country. I have not travelled much, it is true, but nowhere have I found a soil so fine as in the Province of Quebec. The soil is fertile. The season of vegetation is not very long; but the fertility of the soil compensates for this inconvenience, by the rapid ripening of the crops it produces.

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INSPECTION.

INSPECTOR PAINCHAUD.

TO THE HON. COMMISSIONER

OF AGRICULTURE AND COLONISATION,

QUEBEC.

Sir,

I have the honour to submit to you my report, for 1890, as inspector of creameries and cheese-factories.

I began my inspections on June 18th, and finished 26th September. I visited 102 cheese-factories, 42 creameries, and 8 combined factories: in all, 152 establishments.

I find that rather less progress has been made in the processes of manufacture this year than in the preceding years; many makers are negligent and follow the old routine, though they could do better. As for those who know nothing, or hardly anything, about the business, I advise them to go to school.

As in my former reports of the last few years, I will mention the defects that I found in my visits as regards the manufacture of butter and cheese. This is going repeatedly over and over the same thing, but, after all, this is the purpose of the inspectors' reports.

The construction of the factories is slowly improving; still, many built like barns remain, and the cheese-room, in which it is of the greatest importance to retain an equable temperature for the ripening of the cheese, is the part chiefly in fault. With precautions, it is possible to make good cheese in an inferior building, but it is utterly impossible to preserve it in good order in a room that varies with every change of external temperature. There are still many factories with bad fittings, and here I must observe that in several places there are far too many factories; in places where one good one would suffice, there are three or four, all acting in opposition, and, generally speaking, turning out by no means the best goods. These small factories are usually badly supplied with the utensils and conveniences necessary to furnish the best articles of cheese. The work in them is scamped over (*à la diable*), and it is in such factories that second-class makers are generally to be found. But this multiplication of opposing factories is often the fault of the patrons, who, fearing lest the proprietor of a factory should make money, although he may give them perfect satisfaction, say among themselves: "he's going to get too rich, we must start an opposition;" and immediately a factory is built, which often returns less profit to the patrons, and, almost invariably causes a loss to the proprietors. As a general rule, in order that a factory be carried on in a proper manner and give entire satisfaction to the patrons, it must pay a profit; otherwise it would be better to "shut up shop."

Before speaking about the chief faults in the processes of manufacture, I will say a word on the care to be bestowed on the milk at the patron's house. During my inspections, I have paid much attention to this important point, and after having closely examined the thing, I find that the milk is, in general, very carelessly treated.

First of all, the cans, full of whey, are allowed to remain part of the day exposed to the sun. How often have I seen them standing, late in the afternoon, on the little platforms by the road side! And after the can has been thus tainted, it is sometimes only washed with cold water; a treatment of which I have, accidentally, been twice a witness; and even if it is washed with hot water, it is often only rinsed. What sort of milk can be expected to be received at the factory in such carelessly treated vessels, especially if this milk has not been well cooled and aerated, particularly the latter; and it is in this point that the patrons generally sin. As to the cooling, that is usually more or less sufficiently attended to, but the stirring and the aeration it is almost impossible to get done.

But it must be allowed that in past times the patrons have been so used to take badly cared for milk to the factory, that, nowadays, they fancy the advice given them by the maker as to the care of the milk is nothing but a caprice of his own.

Makers must redouble the precaution and severity they exercise in receiving the milk, and strive to persuade their patrons that they are hazarding their own interests in treating their milk with so little care; they must especially make them understand that bad milk yields less cheese than good, and that of inferior quality. Let us follow the example of our neighbours the cheese-makers of Ontario, of whom I have met several during my summer journeys. They are all very careful about the reception of the milk.

Another point in the reception of the milk, and one about which very few concern themselves, regards its adulteration: out of the 152 factories I visited, there are not certainly twenty where this is carefully attended to. It is true that it would be a difficult task for many makers, as they do not know how to test milk. I consider this to be a very important point, for to neglect it is neither more nor less than to encourage theft, and, in some degree to take part in it; for the maker is regarded justly as the guardian of the interests of all the patrons. If some of them enrich themselves at the expense of the others, owing to the negligence of the maker in not exercising proper vigilance, he must bear his share of the responsibility. We, the inspectors, having often occasion to test the milk in divers places, are in a position to say that more frauds, either by skimming or by adding water, are committed in this matter than is usually supposed.

One day, in the month of August, I was requested to examine the milk of all the patrons of a creamery; the maker, though otherwise pretty well skilled in his work, knew not how to test milk. He said to me: "It takes 25 to 26 pounds of milk to make a pound of butter; I do not understand how that can be; I think my patrons put water to their milk;" he had learned, from another quarter, that some of them did so; and, in fact, after having examined the milk, I found signs of the addition of water in a good many samples. My in-

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spection having frightened the people, it produced a very good effect, for the next day, the quantity of milk had diminished, and the percentage of butter had increased. There are many places like the above, where frauds are carried on on a scale more or less great. Patrons who are disposed to be dishonest rapidly gain assurance when they are not watched.

Among the faults in the manufacture I will only mention the principal and most general. First as to the temperature. As a general rule, makers do not sufficiently attend to the temperature during the whole time occupied in making, from the adding of the rennet to the moulding of the curd. The temperature is one of the most important points in the manufacture; it is the temperature that governs, almost entirely, the whole work, and, in a measure, on it depends the good or bad results of the manufactured article. For the adding of the rennet to the milk, the heat must be varied according to the season and the staleness (*degré d'avancement*) of the milk. As to the heating (*cuisson*), it only varies in the case of very stale milk; this may be heated one or two degrees less high than usual—98 F. When the curd remains rather longer than usual in the whey, especially when the vat is not very full, we must not forget to warm it up again as much as is required to keep it always at the same temperature. It is especially after the drawing off of the whey, while the curd is fermenting in the vat, that it must be looked after, in order to keep the heat always at the same degree, that the fermentation may go on well: in proportion to the cooling is the delay in the fermentation.

To keep the curd warm, a lid that covers the whole vat is required; this is often made too small, so that a space is left open all round the vat, and made in this way, it is of little use.

One very great, and common error is that the curd is not allowed to gain enough acidity before the whey is drawn off. The curd applied to a hot iron must give distinct and very numerous threads of from $\frac{1}{2}$ a line to a line in length. If whey is drawn off in too sweet a condition, the cheese will be invariably soft and open.

Many, too, commit the fault of grinding the curd too soon; it is not allowed to ferment long enough, because the maker wants to have finished his day's work. The consequence of this hurry is that the cheese has not the desired firmness.

In concluding these remarks on the making of cheese, I recommend the makers to attend more carefully to the pressing of the cheese, to tighten the press very often during the first few hours, to make the pieces consolidate well together; unless this is done, the cheese will not be firm. I also advise them to make their cheeses more uniform in size, and to make them as large as possible that the boxes may be well filled up.

What I said about the care to be taken in the reception of the milk is as important at the creamery as at the cheese-factory, but in spite of that, it is at the creameries that this is the least attended to. Generally speaking, the whole of the milk is accepted, so long as it is not too sour; and that it will go through the separator without curdling. It must be remembered that bad milk, stale or in a state of decomposition, will yield less butter than good milk; it is less easily skimmed. Bad milk, of whatever kind, should not be accepted

at the creamery any more than at the cheese factory: it affects the quality of the butter as much as of the cheese.

One improvement has been this year made in the creameries, at least in those I have visited; the number of ice-houses has increased. They are not all well made or large enough; still, there is a good beginning made.

As to the making of the butter itself, the treatment of the cream, the churning, pressing, etc., the same routine is almost always followed. The rarity of good butter makers sufficiently explains this. In looking over the list of the creameries visited this season, I can only find the names of 15 men whom I can recommend as good makers; this easily accounts for our butter not being always of good quality.

Rare enough are the creameries in which you will see the cream sufficiently cooled after skimming, and preserved and treated on the best principles up to the time of churning. As to the cooling, it is not always the maker's fault; when he has not the water and ice at hand, it is not very possible to cool the cream to a low temperature immediately after skimming, and thereby to get a firm sound-keeping butter. Stirring the cream often is of importance if it is desired to make a butter with a fine aroma; besides, cream that has been frequently stirred, (1) will yield more butter than cream that has been less frequently agitated.

Churning is always done at too high a temperature in hot weather. Instead of starting at 55° to 57°, as should be done, it is often at 62° to 63°; so that, instead of butter, something like a mash (*bouette*) is produced; and this, as it can neither be washed nor be freed from the butter-milk, is greasy and will not keep.

Factories that have a cold chamber for the keeping of their butter are not yet common; still, there is an improvement on this point. A good number of them have, this summer, sent their butter to Montreal in a fresh condition, either to be sold at once, or to be sent to the ice-house while waiting for sale. This is an excellent plan, and will, it is to be hoped, become general; it is the surest way of always getting the highest market price.

The methods of manufacturing our dairy goods, especially butter, suffer under a pressing want of improvement if we wish to sell them with profit.

To this end, practical and thorough instruction is needed; without it we shall never succeed. It is to be hoped the project of factory-syndicates will prosper, for it is indisputably the best system of instruction that we can adopt. An inspector that has 25 or 30 factories to visit several times in the season, can do twenty times as much good by his teaching, and by staying the requisite time in each factory, as he who, as is the practice to-day, has to visit 150.

Respectfully submitted,

(Signed) J. L. PAINCHAUD.

(1) A brewer would use the word "roused." A. R. J. F.

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DISCUSSION.

M. SAUL COTÉ—Can you tell us, Monsieur Painchaud, what difference was made in the yield, after you had inspected the creamery of which you spoke just now as having taken 26 lbs. of milk to the pound of butter?

M. PAINCHAUD—I do not know what the difference was, but I was told that there was an improvement, and that the proportion of butter to milk was the same as it is usually.

M. COTÉ—It was in August, was it not?

M. PAINCHAUD—Yes.

M. COTÉ—Some one told me that it had fallen to 23½ lbs; this makes a difference of 2½ lbs. This is worth the trouble it cost. Now, speaking of syndicates; is it not true that, if there were inspectors who visited the factories every week, or every second week, it would be easy for them to prevent the frauds that take place?

M. PAINCHAUD—They would certainly be the right men to see after such things, for a stranger is always more attended to than the maker.

M. COTÉ—And, besides, the makers do not, as a rule, test the milk.

M. PAINCHAUD—No, that is not done.

M. COTÉ—You do not find that there has been much improvement in the construction of the cheese factories?

M. PAINCHAUD—There is some improvement, but it is a very slow one.

M. L'ABBÉ MONTMINY—Do you find any improvement in the skill of the makers of butter and cheese?

M. PAINCHAUD—A little; but, during the last two years, only a little.

M. MONTMINY—The number of factories and of makers having increased, do you find that the skill of the makers has increased in proportion?

M. PAINCHAUD—No, sir.

M. MONTMINY—Now, you find in your visits, beyond all doubt, that there are frauds committed in the delivery of the milk at a great number of the factories you have visited?

M. PAINCHAUD—I have found out frauds everywhere, or almost everywhere, where I have examined the milk.

M. MONTMINY—Mr. president, I desire forcibly to draw the attention of the convention to this point. We are proud of having carried off the first prize in England; no doubt about it; but I ascertain, from M. Painchaud's report, what I knew beforehand from other sources, that there are still more bad makers than formerly, and that the good ones are the subjects of persecution by the bad ones. This I have found to be the case in our district. I desire that this point be thoroughly investigated; that a remedy be sought, which would doubtless not cure the evil radically, but which would enable us to reduce the number of the bad makers. This end might be reached either by certificates or in some other way. If we go on as we are doing at present, it will soon be said of us as it has been said of other countries: that we make inferior cheese. Thus, we shall lose the English market; and if we do, we shall have to go to China, and we shall find that a long voyage.

AUD.

What we, the members of the Dairymen's Association, have to do, is to make this question conspicuously clear, so that the members of the two Chambers be able to form an opinion about this thorn in the side of the dairy-industry which threatens to do us a great deal of injury.

I do not know exactly what remedy we can adopt; perhaps, we might succeed by gentle means. But I should be very glad if those who are at the head of the movement and understand these things far better than I, would state their views as to the means of putting a stop to the disastrous effects of incapacity and dishonesty.

M. LE DOCTEUR BRUNEAU—I should like to know from M. Painchaud if the improvement in the yield on the occasion he spoke of took place immediately after one of his visits?

M. PAINCHAUD—Certainly.

M. BRUNEAU—Do you not think that the maker, on that occasion, improved his method of working? Might he not have churned at a lower temperature?

M. PAINCHAUD—No, sir, I do not see any reason to suppose he altered his mode of making butter.

M. BRUNEAU—Not from something you may have told him?

M. PAINCHAUD—I had no reason to tell him to alter his way of working.

M. BRUNEAU—Is it not the case, Monsieur, that every one who knows how to make butter, knows that by churning at a high temperature we get much less butter?

M. PAINCHAUD—True; but this affects the quality still more than the quantity.

M. BRUNEAU—Well, Mr. President and Mr. Inspector, I have read somewhere in a well informed English paper that a lady, whose butter was always of first-rate quality, changed her dairymaid one fine morning. The new girl was told to put the thermometer into the cream, and to churn when it showed such and such a temperature. The servant, a novice, did not use the instrument, but contented herself with trying the milk with her finger, when her mistress was away. When the latter returned, she exclaimed: "How is this? I generally get 21 lbs. of butter, and there are now only 14 lbs? Have you kept back any cream?" The maid replied: "No, it is all there." "You have been churning too high," said the mistress; "churn the buttermilk over again." I read in that English paper, a paper that does not joke on such subjects, that the second churning yielded 7 lbs. of butter! I have seen similar facts related in U. S. papers; and I will even state that in my own dairy this autumn, pretty nearly the same thing happened. My wife found the quantity of butter short in a certain churning, and the servant confessed that she had put some warm water to the cream, because the butter was long in coming!

I thought then that, in the case which you have just mentioned, Monsieur Painchaud, there might be something analogous; and it was for that reason that I asked you if the maker had changed his mode of working in consequence of the remarks you had made to him. But you really believe that the difference in the yield of the milk is simply due to the fact that, after your visit, the patrons brought to the creamery a richer milk than before. This is what you advance, is it not?

M. PAINCHAUD—Yes, in this case.

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M. BRUNEAU—I accept your explanation, but I thought it best that the question should first be cleared up.

M. PAINCHAUD—It is thoroughly understood, and besides we find it to be the case every day in our inspections, that when the cream is churned at the right temperature the greatest yields are produced.

M. CARDIN—Apropos of the makers of butter and cheese, this remark has occurred to me: if, for the obtaining of a diploma permitting us to practise any of the professions, we have to pass an examination, ought not the dairy-industry to be put on the same footing, considering it is so great a source of profit to the Province of Quebec. I think it would be a move of the greatest importance to name examiners, who should cause the butter and cheese-makers to pass the necessary examinations, as is done in the case of advocates, land-surveyors, etc.; such examinations as would prove the capability of the makers, and confer upon them a diploma testifying to their fitness as makers of butter and cheese. This would assure the future of the Province of Quebec in its onward march over the path of progress opened to it by this grand association for the promotion of the dairy-industry. I submit this humble suggestion of mine to the favourable consideration of the members of the Dairymen's Association.

THE PRESIDENT—We have already, before to-day, investigated the idea you have just mentioned. It was a difficulty apparently hard to solve, but I am happy to inform you that the directors are determined to carry out the plan. If there are a good many good makers, there are, too, a good many incompetent ones. And the fact that no character is demanded of them when applying for the post of head of a factory, and that it is taken to be enough to get them the place if they declare themselves to be perfectly competent, under the pretext of having worked for such and such a master, or in such and such a factory, shows how much need there is of such a step as that mentioned by M. Cardin (1). No information as to their capabilities is sought for; they are engaged at the lowest possible salaries, and the result often is, the production of inferior goods.

And what obliges us to pay low salaries to the makers, is the fact that the moment a factory appears to be prospering, people are in the habit of setting up one, two, or three more in the neighbourhood, which wage an interne-cine war with one another.

There is a contest as to who shall get the greatest quantity of milk sent to his factory. All sorts of means are used to this end. To retain certain of the patrons, faults in their milk are necessarily lightly passed over.

You were speaking about frauds; of cream taken from the milk, and of water added to it; what is the cause of these things? It is competition.

Inspection there is, but it is neither general enough, nor thorough enough. There may be supervision in certain factories, and yet, for fear of losing some of the patrons, defects in the milk are tolerated. If these patrons were found fault with, they would reply: "You are not satisfied? I shall take my milk to your neighbour, who is not so particular as you are." The other factory accepts their milk; and when the yield is reckoned up, people say to them-

(1) Rather paraphractical, but I think it gives the speaker's meaning. A. R. J. F.

selves: "Oh, this is quite impossible, our milk is not so poor as that." The good, honest ones think: "I had so many pounds of milk, and yet I only received so much for it: it does not pay."

Sometimes, again, means are taken in some of the factories to delude patrons into the belief that the factories in question pay more than their neighbours do. Could a certain number of factories be amalgamated, it would be a great step in advance.

The organisation of syndicates uniting 25 or 30 factories, clubbing together to pay an inspector who should visit them as often as possible, would ensure a uniform article, and make those fraudulent patrons just mentioned afraid of continuing their thefts. As M. Painchaud told us, a stranger would be more attended to than the maker, when he was called upon to test a sample of milk. I believe that this reform is likely soon to go into effect.

It is true there is in existence a law for the prevention of fraud; but the great difficulty is how to apply it. The law is severe enough, but the competition that abounds everywhere renders its application difficult. Farmers must be made to understand that it is for their interest that the milk should be carefully treated, and that the manufacture of a really superior article would add greatly to their profits.

M. CHAPPAIS—Here I must add a few words on the question introduced by M. Montminy, one of the most important before the convention. In 1884, at the Quebec meeting, I had taken the initiative in proposing a resolution tending to the same end as that M. Montminy aims at. At that time, if you remember, the project, which was accepted, but to which, later on, objections were found, consisted in asking the inspectors of the association who found any factories to be well conducted to report them to the association, in order that the names of the makers who managed these factories might be inscribed in a special book, to be called the *Golden Book* of the makers, whence information on the subject might be drawn.

The resolution was carried unanimously, but in its execution, in the application of its details, it was found to be premature; the progress of the dairy-industry was found to be too slow to allow of the introduction of so radical a measure, a measure having for its aim the elimination of the unskilful makers and the bringing forward of the skilled ones. The subject was fully discussed at the time, and I thought it right to yield to the reasons assigned: so my resolution fell dead. Nevertheless, it is enrolled in the archives of the association, and I beg it may be recollected that it is my "act and deed," for I have always held, ever since I have been interested in the dairy-industry, that the great hindrance to the development of that business, is the number of inferior makers.

For several months, I have had still greater opportunities of observing that the number of inferior makers is increasing in a very great ratio. The number of makers increases, but at the same time so does the number of bad makers. And the reason is easily shown: it is because we have no source whence they may derive a knowledge of their art. Thoroughly recognising that the dairy-schools aided by the association have produced a certain good

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result, I am compelled to state that we have not done all that might have been done, and that a great deal remains to be done in that direction.

The project of establishing factory-syndicates, spoken of by the president, is an excellent plan for the improvement of the present position of the trade. There is no question but that an inspector-general, perfectly qualified as to his knowledge of every detail in the manufacture of butter and cheese, acquainted with every point in it, not only practically but theoretically, will be perfectly capable of instructing the local inspectors who are appointed to direct the syndicates. These inspectors, who are called upon to visit the factories frequently, and the inspector-general, must be experts; and in this way the position may be improved.

But there is more than this to be considered: the syndicates have begun to work this year; they will increase in number next year, and, ultimately, we expect the formation of 11 regions.

We must do as M. Cardin advises: why do we compel notaries and advocates to take out a diploma before they can practise their professions? Because we want to ascertain that these gentlemen are qualified. We must be as exigent as regards the makers of butter and cheese.

Whither do the notaries, the physicians, the advocates go to get their diplomas? They go to school; either to college or to the university. As M. Painchaud said in his report: "As for the makers who do not know their business, let them go to school and learn it." But, gentlemen, they cannot go thither, for we have no schools.

The grand point, then, for our association and for all those interested in this matter, is to promote the idea of the creation of a great school of dairy-work, and to stir up people's minds in this direction; so that our members of both the local and the federal parliaments, without exception, may take this subject into consideration, and labour for the establishment of such a school. In this way, the makers will be able to get diplomas certifying to their abilities as makers of butter and cheese, and by these means we shall bring about the prosperity of the great dairy-industry, which is to us the source of so much profit.

M. L'ABBÉ CHARTIER—As we have to contend with an evil that is so deeply rooted and so extensively spread over the province, I should be glad if the convention would convey a wish of theirs to the dealers. The means that have been proposed up to the present will, doubtless, gradually get rid of the evil; but if the dealers and the wholesale merchants would help us, I think it would disappear more rapidly.

If these persons would refuse to buy inferior cheese at any price, the proprietors of the factories and the patrons would take care to engage makers capable of turning out an article fit for the market. I do not blame the dealers. If they have to suffer themselves on this account, let them be conscientious and help us.

Two or three years ago we found out that a mixture of cheese of various qualities had appeared on the English market. A wholesale merchant had the honesty and frankness to confess to us that it was the custom in commerce to mix cheeses. We could not understand why partially skim-cheese should

fetch almost as high a price as the full-cream, seeing that it has been thoroughly proved that at the end of two or three months, the poor cheese begins to deteriorate, and that the longer it is kept in store, the less it is worth. Well, these merchants bought a lot of poor cheeses, and put a certain number of them in the invoices they sent. Thus, when the cheeses came upon the market, they did not give satisfaction, and the English could not make out why the Canadian cheese was not of uniform quality. They bought a lot of good cheeses, and from time to time, they hit upon a bad one.

So, that I do not think it inopportune for the convention to express a wish that the dealers would come to its aid, in order to completely get rid of such cheese, the quality of which would cause us to lose our market. That would be an enormous loss to the province.

With such unfavourable seasons as we have, if we were to lose the market for our dairy goods, frankly speaking, I do not know what would become of the farming class of the province. It is, therefore, clearly for the interest of the patrons, of the proprietors of the cheese factories, as well as of the dealers, to unite their efforts to ours to get rid of incompetent makers.

M. SAUL COTÉ—I hope that, in spite of his great competence, M. Chapais will pardon me if I differ from him as regards his opinion of the makers. I am neither a patron nor a proprietor of cheese-factories, but I am, rather, a maker. Allow me to take the part of the latter. I must say that if the proprietors will not agree together to build better factories, it will be a matter of difficulty for the makers always to turn out good cheese. You will say, perhaps, that it is the business of the maker to see to that. But these young men are often wanting in energy. They engage themselves to proprietors who oblige them, on account of the existing competition, to accept milk that is not by any means too good, and to put up with drying-rooms that are not fit to keep the cheese in sound condition.

We must not throw the whole burden on the makers' back: let the proprietors furnish good materials, and I think the cheese will be all the better for it. They, the makers, are willing to learn, but we must not try to make them do what is impossible.

I hope the makers will not be annoyed at me for defending them, and if the farmers and the factory proprietors find me hard upon them, let them state their reasons.

The milk is sent in very bad order; and then the maker does his share of the work, more or less skilfully, but not so badly as M. Chapais would lead us to think. With bad milk and a badly constructed building, how can you expect the maker to deliver good cheese on the market? Very often it is not his fault, and he does not even get time to test the milk. The factory is on so small a scale that the owner will not incur the expense of an assistant, and, consequently, the maker has not time to do all his work.

I can conceive that if the cheese-makers were to receive a diploma, they might do better, but they are not so faulty as people suppose.

M. CHAPAIS—I had no intention of attacking in my remarks the body of cheese-makers. But M. Painchaud, in his report, mentions several defects that concur in causing the making of inferior cheese, viz., bad buildings, bad milk,

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and unskilful makers. I have treated one of these points; let the others be treated also; I ask nothing better. But I speak of unskilful makers, where they exist; where there are none, I do not speak of them. As for there being some, I know there are.

I am ready to admit that there are many other causes for the making of bad cheese, but the want of skill in the maker is one of them. I do not want it to be understood, though, that I said the makers were, as a rule, incompetent: let him whom the cap fits, wear it.

M. VAILLANCOURT—According to M. Painchaud's report, a good deal of improvement remains to be made in the manufacture of butter and cheese. We must, positively, in criticising our position, avoid making false statements, for M. Painchaud has without doubt given us an opportunity of speaking frankly. Well, I believe the dealers are prepared to state that two-thirds of the cheese made in the Province of Quebec leaves much to be desired. Though it pains me to say so, I think it ought to be said. If our cheese has so high a reputation on the English market, the credit must be given not to the Province of Quebec but to Ontario.

There is as good cheese made in Quebec as in Ontario, but good cheese is more general in Upper Canada.

Decidedly the best means of improving our position would be to have inspectors whose work would be less onerous than is at present the work allotted to them. I do not want to speak of their capability, but they have too much work to be able to make their inspections useful to the makers. Last year, I met on the road inspectors who had visited 12 or 15 factories during the day, and out of that number there were not perhaps more than three where first-rate cheese was made; so, I told them: "The visits you have made to-day, I do not consider to be worth a dollar to the people; for you have not had time to teach the makers what they ought to do."

I believe that the most practical way would be to have inspectors who could afford time to pass two or three days at each factory, to explain thoroughly to the makers the best methods of manufacturing their goods. And this during the whole season of manufacture. If the visit of the inspector take place in hot weather, let him show how cheese should be made in hot weather, and then let him say: when the cold weather arrives, the method must be varied in such and such a way.

For, the greater number of makers work mechanically. Ask them why they make mottled, spotted cheese: they do not know. Every day, mottled cheese is sent to the Montreal market, and most of the makers are ignorant of the cause.

If the inspector were to pass several days, even a week, in one of the factories, you would have there a maker who, even if he did not understand his work perfectly, would have learned a good deal about it.

As for butter, we are not making much progress in its improvement; during the last two years, I fancy our butter instead of improving in quality has become worse; and I am sorry that M. Langlois has left, for he made a similar remark to me a few days ago. He retails a good deal of butter, in town, and when one sells by retail, one sees the whole contents of the tub, and all its defects.

M. TACHÉ—And you pay for it?

M. VAILLANCOURT—Certainly, we pay for it. It is true this system of inspection will be costly, but where the inspector remains at any factory two or three days, the owner of that factory ought to pay his expenses. I do not know what arrangements the directors mean to adopt on this point; but so long as you have not inspectors who will go and stay in the factories and teach the makers by working with them, I do not think you will succeed in making very rapid improvement.

The reverend gentleman who spoke before me, made mention of the merchants. He begged them not to buy inferior cheese. This would be a difficult thing to bring about. It would be to change the system of commerce all over the world. For in every branch of commerce, there are the first, second, and third qualities of goods, and in some places, the second and third qualities sell more quickly than the first, owing to the financial position of the people.

As to skim-cheese being foisted in among full creams, perhaps M. l'Abbé alluded to what was said in my presence three years ago. But I do not think that the dealer in question said that poor cheese was sent out mixed with the full cream. Lots made up of partial skims may be sent out without it being mentioned that they are skims; but I do not think skims are mixed with full creams; at least, I have never known of such a thing being done.

THE PRESIDENT—If you have never done so, others may have.

M. VAILLANCOURT—Lots of skims may be sent out, but not mixed with full creams; for that would be to mix good and bad together.

THE PRESIDENT—When you buy cheese, do you make a great difference in the price between good and bad? You say that you have visited many a factory, and that it is very seldom good cheese is to be found. Therefore there is some good. I should, therefore, like to know from you if you make a great difference in the prices. From what one hears, prices are uniform; the man that makes good cheese does not get more than he who makes bad cheese.

M. VAILLANCOURT—That is an exaggeration.

M. TACHÉ—It is not exactly true; still it is true to a certain extent.

M. VAILLANCOURT—Sometimes two lots of cheese may fetch the same price, if the difference between the two is not very great. But when you buy a first-rate cheese, if the neighbour's is only of the third quality, it certainly will not fetch as much.

THE PRESIDENT—We see no difference in the account of sales; from what one hears, all the cheese made is good.

M. VAILLANCOURT—Please observe that the makers often take their cheese to Montreal to sell, and on their return they pretend they have got, say, 9½ cents for it, when, in reality, the price paid was only 9 cents. They prefer paying the difference out of their own pocket. This is done on a large scale.

THE PRESIDENT—Do not the dealers lend themselves to this trick? I have heard it said (though perhaps it may not be true) that the makers arrange the following little bargain with the merchants: "I accept your offer, but it must be understood that in the stated account you send me, the price shall be entered as so and so." At the same time, the neighbouring maker,

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who speaks frankly, says to himself: "It's queer; I make a better article, and still I cannot get better prices." Does not this sort of thing go on? (1)

M. VAILLANCOURT—It is sometimes done; a man comes to us, or goes elsewhere, he sells his cheese at such a price, and he says: "Make me out a bill a cent or half a cent higher than the real price." I do not think we commit a mortal sin in obliging him. (Laughter.)

THE PRESIDENT—It is a pretty serious sin, in my opinion. (Laughter.) There are theologians here who will tell you that the fault is by no means a light one, for you are acting unfairly towards the honest men. A truly upright man says, frankly, that he has got so much for his goods, and he is set down at once as a bungler, and people say: "It pays better to go to the other factory: let's go there; he sold his goods for half or three quarters of a cent more." And thus you encourage fraud, and make the honest man lose his clients.

M. VAILLANCOURT—He who asks us to make out his bill in this way does not say what he means to do with it, he does not tell us it is to be shown to his clients; very often he only asks the clerks of the firm to give him this account. The clerks do so, but if they thought that by so doing they were helping people to cheat, I do not think that they would do it. Plainly, we do not know the reasons why they ask for such an account.

THE PRESIDENT—But you are intelligent enough to guess at them.

M. L'ABBÉ COTÉ—These people do not say: Rob for us; but only: Allow us to rob, (laughter).

M. F. N. DAIGNAULT—I, myself, have had experience in this thing. My neighbour had sold his June butter for, so he said, $17\frac{1}{2}$ cents. I had no offer for my June butter. On July 15th, I spoke to the dealers about my June and July butter, and I had an offer: June 16 cents, July $16\frac{1}{2}$ cents. I said to myself: I cannot accept it; my neighbour sold his for $17\frac{1}{2}$ cents; my patrons will keep their milk at home. The dealers replied that they could not pay more. At the end of August, I went to three firms, among which was the one that had made me an offer for the June and July butter. And after several parleys with the merchants and a journey to Montreal, I had to sell the three months at 16 cents, although the firm that had offered me $16\frac{1}{2}$ for the July butter had told me, but too late, that it would have given me also $16\frac{1}{2}$ cents for August. Nevertheless, the other creamery, which had sold at $17\frac{1}{2}$ cents a pound, immediately after the end of June and July, only paid its patrons 53 cents per 100 lbs. of milk, whereas I, although the other sold his butter $1\frac{1}{2}$ cents dearer than I did, was able to pay all but 56 cents. The dealer to whom he had sold his butter had come to an understanding with the maker: "You lower the amount of weight, and people will say the sale was made at such and such a price: it will come to the same thing." Thus, I had to make my patrons lose $\frac{1}{2}$ a cent a pound for the two months.

THE PRESIDENT—M. Vaillancourt, you ought to advise your fellow dealers to give up these practices.

(1) The old Scotch phrase for l'état de compte, in 1714, was "a fitted account." A.R.J.F.

FACTORY SYNDICATES.

M. TACHÉ—As regards the improvement of the manufacture of dairy-goods in this province, it is important to set forth the present position of the association. If we have not been able before this time to grant diplomas to the makers, it is because there have been considerable impediments in the way.

We find ourselves in this position: we have a dairy-industry, at work throughout the Province of Quebec, that is to say, a dairy-industry perfect as to its organisation, yet absolutely devoid, or almost devoid, of a school. On the other hand, none of the makers, a great number of whom are well qualified as regards the methods of manufacture, can leave their factories during the whole summer to obtain the diplomas I mentioned just now: diplomas that would be at once a recommendation for the makers to those who wish to engage them, and a guarantee to the latter.

In winter, we have no school to which these makers, occupied all the summer as they are, can resort. Hence, the immense importance of obtaining a school as soon as possible, a school that shall be open both winter and summer.

We have practical schools for makers that open a few days before the other factories. But these schools being simply under the direction of makers, like all our factories, cannot form a board of examiners; they are just well managed factories, where the makers can get information about the best methods of working. For these schools are not so constituted as to be fitted to hold examinations, or to be authorised to confer diplomas.

On the other hand, our dairy-industry being organised, it is absolutely essential that measures, more efficacious than those at present existing, be adopted. When the Dairymen's Association was founded, the dairy-industry was already in existence; but its progress was so little marked, that the labour of the association thoroughly succeeded, and has yielded a plentiful crop of fruit. But now we have reached a state of perfection, or rather a degree of relative advancement, and this that is before us is infinitely more difficult than that the association had to face at its inception. Hence, the necessity of changing its methods.

At first, we had excellent makers, who visited the factories to teach the mode of working. They only remained as short a time as possible, for they had before them a task too great for their powers. In spite of all their good will, our inspectors have never been able to visit all our factories in the course of the summer. Well, even this trifling inspection has been productive of good. But, to-day, it is no longer sufficient; the means hitherto in use must be modified to adapt them to encounter our new requirements.

Two years ago, the Dairymen's Association, at the L'Assomption meeting, proposed that steps should be taken to obtain from the government the subsidising of associations of proprietors who should join together for the purpose of appointing inspectors. Hardly a year afterward, the Bedford Association passed a similar resolution. But I must confess, to the credit of the people of that district, they put this resolution in practice before we did. The Bedford district got their project of syndicates into operation last year.

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In order to sum up this question, allow me to read to you part of the circular sent out to announce this convention :

"To our members, old and new, we have sent this Spring a programme showing the conditions under which syndicates of CHEESE-FACTORIES or of CREAMERIES can be established. We again call attention to this programme. The association is striving to cause to be appreciated the immense importance of working with a little more earnestness for the improvement of the manufacture. To form a syndicate is, in two words, for the proprietors of factories in the same district or region (but not more than 25 or 30 in number) :

"1. To engage a first-class maker, whose duty it shall be to superintend the manufacture and to test the milk ; in order to do which he shall, during the whole summer, visit the factories ; 2. to supply, from a common purse, the cost of this surveillance and teaching.

The local government promised last year to pay half the cost of the instruction given by the syndicates, and there is no reason to suppose that this assistance will be withheld in future."

"For its part, the association will take steps to prepare the inspectors, who are to be engaged by the syndicates, for a suitable discharge of their duties."

Yesterday evening, before the board of directors, the question of this organisation of syndicates again arose ; we know that, without much having been said about it in public, we may reckon on 11 or 12 regions being ready to organise themselves in this way : each proprietor of a factory engages to subscribe a certain sum, either a fixed sum, equal in all cases, or a sum in proportion to the relative importance of each factory. The amount subscribed will be used to pay a man, a good maker, recommended by the Dairymen's Association, to keep constantly throughout next season visiting the factories composing each syndicate.

Remark one thing : the syndicates must not consist of more than thirty factories each. Otherwise the inspector would have too much to do. Still better, if there are only twenty factories in a syndicate, for they will enjoy the visits of the inspector more frequently.

Lastly, you can easily afford the expense of this inspection ; it will not be very great. You are not obliged to engage a man of transcendent abilities, to whom you must pay very high wages. The wages of a good maker will be enough, for travelling about a whole season is not more fatiguing than working. And while accepting the salary of a maker, I think these inspectors will find it answer their purpose, on account of the reputation they will thus gain. So that, I doubt not, it will be easy to hire an inspector for the wages generally paid to a good maker, \$250 to \$300.

The collateral expenses occasioned by the inspection will not be very great. We estimate them at from \$100 to \$150. But Mr. Fisher told me last night that the inspector engaged by the syndicate of the county of Shefford, a man perfectly fit for his post, at a salary of \$500, had only cost the syndicate an additional sum of little more than \$50 in the course of the summer ; the syndicate having furnished him with a horse, and each maker taking the inspector into his house to board when he visited any factory. It is not difficult for a

maker to induce the inspector to take his meals at the former's house, and the expense would be but a trifle.

In any case, from \$100 to \$150 would amply defray the cost, and according to all appearances, the Minister of Agriculture would furnish half the sum necessary to pay the outlay made by the syndicate to the amount of \$250. And it is my duty to say that, out of the factories in the Province of Quebec, there is not probably one that does not lose five times ten dollars in the course of the year owing to the fault of the maker or the patrons,—from the ignorance of the makers, or from the bad condition of the milk delivered by the patrons.

Instead of its being an expense to the factory, this payment to the funds of the syndicates will, without doubt, be a source of large profits. The average price of cheese in Western Ontario is certainly a cent higher than the price paid in the Province of Quebec. If I am right, I should be glad if the dealers present would confirm this my assertion.

M. VAILLANCOURT—A cent is a little too much, perhaps; but $\frac{3}{4}$ of a cent is about right.

M. TACHÉ—If we can reach this point the gain would be very great; let each of us, for himself, just calculate the importance of these figures.

Next, one tangible result of this inspection will be to make the manufactured goods in any one region, be it county or district, of a uniform character. Two things are required in order to realise good prices: not only must you, individually, make good cheese, but your neighbours must do so, too. If every one around you makes bad cheese, you may do better as to price than they, but your price will always be affected by the make of those neighbours who produce worse goods than yours. But, if you have an inspector whose duty it is to give a uniform tendency to the factories around you, the processes of manufacture being thereby generally improved in your district, will enable you more easily to continue to obtain your good prices.

I ask Mr. Fisher, of Knowlton, and Mr. Fraser, both of whom have assisted to organise these syndicates in the counties of Brome and Missisquoi, to tell us what have been the results obtained this year in their districts by this institution.

MR. FISHER—*Mr. President and Gentlemen:—*

As I feel great difficulty in expressing myself in French, I trust you will pardon the mistakes of pronunciation and idiom I commit in the course of the few explanations I am going to give you on the subject of the syndicates that were established in my neighbourhood this year.

We had, previously, different factories, all working each after its own plan: now, dealers want, above all things, uniformity of quality. We found that these merchants would always willingly pay us more for our cheese if it were made of a uniform quality throughout the entire district. The only way to bring this about, was to teach all the makers to follow the same system of manufacture, and to this end, we decided to engage an inspector, the whole of whose time should be devoted to our factories.

We, therefore, engaged a maker, recommended by Mr. Robertson, the Commissioner of Dairy-Industry for the Dominion, who turned out to be a man

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of ability, and one who knew his work well. Mr. Wherry devoted his whole time and attention throughout the season to only 30 factories. I hear that Messrs. Painchaud and Côté visited perhaps 150 to 175, each, during the season. I am sure every one of these establishments has reaped some profit from these visits, but that is not enough: a single visit in a season will not do much.

Our inspector paid four visits and more to each factory, and at each visit he passed the whole day in working with the cheese maker and giving him the necessary instructions.

I am ashamed to say that our inspector found a great deal of inferior milk in our district. At the beginning of the season he discovered that 11 per cent of the patrons were in the habit of either skimming their milk or of putting water to it. Later on, he found out that there were as many as 17 per cent of such fraudulent patrons.

Every time he verified the existence of this unfortunate state of things, he wrote at once to the patrons, and notified the committee, which dealt with the matter. We have ascertained that since they were thus treated, cases of fraud are much fewer in number, though there are still cases that occasionally occur.

As M. Taché told you, our expenses of inspection have amounted to nearly \$550 for the season. We have raised the money in this way: each factory paid 50 cents for each ton of cheese made, and this rate or subscription gave us nearly \$400 during the season, the thirty factories having made nearly 800 tons of cheese. We had also a promise from the Department at Quebec that it would pay half of the outlay of our syndicates, up to the amount of \$250. The makers and patrons were so well satisfied with the working of the syndicates this year, that next year sixty factories will demand inspectors, so that, next season, we shall want two inspectors instead of one.

I am absolutely sure that the Province of Quebec needs more than two or three inspectors; the task is too great for such a small number. The inspection must positively be local, and the people in each locality must feel themselves sufficiently interested to be willing to provide part of the cost.

The establishment of a factory-school has been asked for to-day. I approve of the project, but I think it is a question, gentlemen, that ought not to be decided upon at present. The makers that are now at work, cannot possibly find time to go to school. But when the system of local inspection is established, there will be factory-schools in every part of the Province of Quebec.

These inspectors are not appointed solely to test the milk, it is their duty also to instruct the makers.

This year, a neighbouring maker told me that at the beginning of the season he did not wish for inspection, that he had not subscribed for it; but at the end of the season, he saw clearly that he could not sell his cheese so high as those could who had enjoyed the benefit of the inspector's instructions, and he asked the inspector to visit his factory. On two occasions, the inspector showed him why he had not made good cheese. It was due to a trifling error, an error in the process that could have been corrected in five minutes. Since that correction, this man has made good cheese and been very successful; "If", said he, "I had had this visit from the inspector at the beginning of the season, it would have saved me \$200."

For these reasons, gentlemen, I think it very important that syndicates be organised throughout the Province of Quebec. As M. Taché very properly says: it is not enough for us to make good cheese; it is important to each maker that his neighbour should make in his factory as good an article as is made in his own. Local inspection will bring this uniformity about.

MR. FOSTER—I am sorry I cannot address you in French, as then I should be sure of being understood by all of you. It is with great pleasure, I assure you, that I find myself present at this convention: meetings of this kind will place the Province of Quebec in the position it ought to occupy before the world at large as a country producing both butter and cheese.

As to the syndicates, I consider that it is solely by their means that we can arrive at the establishment of such a severe style of inspection in our factories as will enable us to gain the end we are aiming at.

I do not think that inspection can be made of practical use, unless it be restricted, in each case, to at most 25 factories.

If an inspector have more than that number to deal with, he cannot have time to test the milk. Now, I feel constrained to say that in the Bedford district, last year, a great deal of milk came to the factories in a state that was hardly fit for pigs. An inspector could remedy such a state of things, while a maker could not, since he has friends against whom he won't act, and others against whom he dare not act. On the contrary, the inspector has no cause to hold his tongue; he denounces the thing at once to the committee, which puts a stop to the abuse at once.

I thank you for this opportunity of laying my opinion before you on this matter. I trust that by our united efforts we shall succeed in organising these syndicates, for I believe that this is the only way to give practical effect to the system of inspection.

M. TACHÉ—I wish, in conclusion, to make a few remarks defining the position of the association on this matter. At a meeting of the board of directors, yesterday evening, it was decided that the inspector of the association should, next season, devote the whole of his time to the surveillance of the sub-inspectors of the syndicates, so that the members of the association must reckon upon this: unless they belong to the syndicates, they will not be visited by an inspector, for they, the chief inspectors, will have to devote their entire time to overlooking the inspectors of the syndicates. The question is so important, that we have come to this conclusion: it were better to suppress entirely our inspection, if such action be necessary to enable us to establish the system of inspection by syndicates.

To-day, as we are here in convention, it would be a matter of importance to pass a resolution calling once more the attention of the Hon. Commissioner of Agriculture and of the members of the government to this project of syndicates. The Department of Agriculture has in its possession a set of papers explaining the method of working to be pursued by the syndicates; the programme, indeed, that was distributed this spring; and on Wednesday morning, a delegation will go to Quebec, to meet the Commissioner of Agriculture, and make fresh efforts to get him to assist us in bringing this project into a definite form, in order that we may begin at once to set about forming syndicates in the Province of Quebec.

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Certain special arrangements will be needed for the organisation of these syndicates. To the efforts of the makers must be added those of the directors. If any of you wish to organise syndicates in your district, we will send some one to assist you.

The president gives us the strongest possible reasons to hope that the government intends to help us. All that remains for us to do is to give the last tug at the collar. And, if nobody thinks it inopportune, it would perhaps be wise to pass a resolution at once, this forenoon, praying the government to take this question into its consideration.

There are present here our natural judges, the buyers of our products, who are represented by several merchants of Montreal, and I should be very glad to hear their personal opinion on the working of these syndicates. Messrs. Vaillancourt, Pickett, Scott, Wilson, and some others will, perhaps, tell us what they think about them.

M. VAILLANCOURT—I have never bought any cheese where syndicates have been formed, but Mr. Pickett, who represents one of the largest Montreal firms, can, I believe, say something about them.

MR. PICKETT—I am sorry I cannot speak French. I heard with much pleasure what Mr. Fisher said about the system of working followed by the syndicates, and I can endorse all that fell from him, as I am well acquainted with the way things are carried on in his part of the country. I know both how they were done formerly, and how they are done to-day.

The \$500 expended for this object are a mere trifle compared with the good that resulted from the outlay. This is the only organisation of inspection that is practical. I admit that this association has, in past times, done some good in the province by its inspectors; but we must not forget that, as M. Taché says, Ontario cheese sells for at least $\frac{1}{4}$ of a cent higher than Quebec cheese. Well, if we are anxious to improve the quality of our cheese, the only way is to establish local inspection.

I do not know a single district containing 30 factories that has not, this year, lost, by its inferior make of cheese, five times the cost of the proposed inspection.

M. TACHÉ—Observe, please, that Mr. Pickett, with Mr. Scott, represents the firm of Ayer & Co., one of the largest in Montreal.

MR. PICKETT—The best plan in training inspectors of syndicates would be, I think, to choose the best maker to be found in each district, and to send him to Upper Canada to learn his business. Such a man, speaking French as he naturally would, could more easily make himself understood here than a maker coming directly from Upper Canada.

M. TACHÉ—The intention of the association is to engage as inspector a person thoroughly informed as to the process pursued in Ontario. Thus, even if the sub-inspectors are not sent thither, the inspector will be well informed as to the manner of working there, and the syndicates will profit by his knowledge.

MR. PICKETT—In Ontario, the manufacture begins earlier in the season, the winter closes sooner than in Lower Canada; thus, our makers could go and study in the Ontario factories before ours open.

MR. WILSON—I agree with what the speakers who have preceded me have said. If you want to preserve your reputation and to compete with the West, you must employ an inspector for each 25 or 30 factories. There is present here a man who has passed three weeks at Brockville, and he can tell you what he saw in that district. I see no reason why we should not make as good cheese in Lower, as is made in Upper Canada. Our milk is quite as good, if the patrons would only take care of it.

A good thing for this part of the country would be the establishment of a school whither the makers might go to gain diplomas. There are many unqualified practitioners in Lower Canada; and if you go to their factories and offer them a less price for their cheese, they reply: "I would rather pay the balance out of my own pocket than let my patrons know that my make is not so good as that of my neighbour's." There is nothing, in my opinion, that would do so much good as a school. The present government is very liberal, I do not see why it should not subsidise such a school.

M. L'ABBÉ MONTMINY—Connected with this dairy-school is a very important question. It would be very useful, I think, to pass a resolution praying the government to interest itself in the matter. There is a school subsidised by the government at l'Assomption: has it sent in its report?

THE PRESIDENT—Before this autumn there had been no report.

M. MONTMINY—Would it not be wise to draw attention to this point, in order that the government may do something, either by increasing the grant to this school, or by supporting two schools, one in the north and another one in the south of the province, in which the makers may take their degrees after acquiring the desired qualifications.

And talking of bad makers of cheese, I wish to be well understood and to define my responsibility; while speaking of unskilful makers, we desire to defend our national industry, and to protect the skilled makers, that we may not all pass for incapables. With these schools of dairy industry to form competent young men and give them their diplomas, we should more surely arrive at the object we have in view.

THE PRESIDENT—There are already different schools in the province subsidised more or less by the Government for the propagation of sound methods; but, as was remarked just now, these schools are open during the general season of manufacture. The makers cannot attend them, unless some one else takes their place at their factory. It is much to be desired that a youth, before engaging himself at a factory, should pass a fair time at one of these schools, under the surveillance of competent men, to learn the art of making butter and cheese, and to become worthy of a certificate of skill.

There are some who have studied under M. Archambault, and who have become good makers, but the association has never thought it right to confer certificates on them, lest the feelings of others might be wounded. And thus has arisen the state of things to day: the greater number of them have passed a month, or two months, in a factory, and then have engaged themselves at a factory, saying that they have worked under such or such a maker, but having no certificate to prove it.

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When a pupil remains long enough at a factory to learn his business, the head man might give him a good character as a capable workman. With the proposed system of syndicates, we should be able to alter for the better the present state of things. A proposition was made yesterday in the board of directors, that a committee consisting of three competent men should be appointed to examine the applications of the candidates for the inspectorship of syndicates, and make them pass an examination; after which, they might give the candidates some complementary ideas of their work, if they were found to be not altogether so competent as might be desired. I think that in this way we should begin to find a remedy for the present state of things. We might get at it more rapidly, it is true, but the change would for the present be too radical a one.

You are aware that there is an intention of having an agricultural school here something like the one at Guelph. I believe, at least that is my opinion, that when it is established, it is to be a complete school of agriculture, and there will doubtless be added to it a dairy school for the instruction of young men in everything relating to agriculture. This is only my opinion that I am stating; but it is determined, at any rate, that there is to be an agricultural school, unless, indeed, the majority of the assembly oppose it. Well, I am convinced, it will be made as complete as possible; but, in the meantime, it will not be unwise to pass resolutions expressing the views of the convention.

M. DUBEAULT—From my point of view, the syndicates would be the surest means of gaining our object. I have been a maker for eleven years, and I ought to understand my business. Allow me to say that, according to my experience, makers, after going to school, may fairly win their diplomas, and afterwards, when they go to work at their trade, show that they are not one whit more competent than before. I have trained youths who, under my own eye, were good makers, but who, the moment they were left to themselves, were negligent in their work. This is to be found in all professions, in all trades; and I therefore think that the organisation of syndicates is preferable to the establishment of schools, as a means of improving the process of manufacture.

Myself, being both maker as well as proprietor, I look after my cheese-makers, and I have often proved that a small piece of advice has great effect. I have known good makers, because I have left them a certain time without watching, make me lose money by taking bad milk into the factory. They said that their cheese was not well made because of the badness of the milk they received; but it was their duty to have refused to accept the bad milk. The employment of a thoroughly well skilled inspector, who will visit the cheese-factories, will secure the manufacture of a more uniform and first-class cheese than can be secured by any other means.

I, for my part, have several factories, and I shall be ready to become member as soon as it shall be desired to start a syndicate in my district. Without flattering myself, I am not one of the worst makers in my part of the country, but it happens sometimes that I, as well as others, have to put bad cheese on the market.

M. L'ABBÉ COTÉ—I do not think it would be well for the inspector to ring a bell by way of giving notice of his arrival in any parish. (Laughter).

M. CHAPAIS—The question before us has been fully discussed, and I think, with M. Taché, that it would be as well for the convention to put the discussion into the form of a resolution. First, as to the syndicates (for this appears to me the chief point), we should pray the government to persevere in the policy it has adopted; and next, we might pass a general resolution, addressed to no one in particular, saying that we are convinced that the foundation of a school at which youths may learn the art of making butter and cheese, and from which they may obtain diplomas, is an excellent idea, and should be put in practice at the earliest opportunity. As for the syndicates, as I said before, we should address the government praying it to continue its policy again this year.

THE PRESIDENT—M. Chapais' idea is very judicious, but I think we should confine ourselves this year to the syndicates. It is better to make our requests gradually rather than all at once.

M. TACHÉ—One of the pioneers of the dairy-industry in the Eastern Townships, Col. Patten, is present. We do not often enjoy the pleasure of seeing him among us, but when there is work to be done with the government, Col. Patten is always one of the most prominent. I hope he will have the goodness to make some remarks on the subject that is now before us.

COL. PATTEN—*Mr. President and Gentlemen:—*

My position to-day reminds me of an historical incident which must be familiar to you all. When Lafayette came to America, and Washington offered him a command in the army, he replied: "I am come hither to learn, not to teach." I may say the same thing to you.

If I am not well acquainted with your tongue, *en revanche*, I am well acquainted with this locality, and it is a source of pleasure to me to visit it to-day, and congratulate you on the progress you have made. It is 18 years since I first became acquainted with the northern of this country. For some years I have been in the habit of travelling through the parishes of the north, and I once paid a visit to the Springs of St. Leon.

Apropos of these springs, I heard a story told of them which bears some relation to the dairy-industry. In the old countries of Europe, some hundreds of years ago, there used to be a fable current about a certain Fountain of Youth, the waters of which had the magic power of restoring the vigour of those who drank of them. And it is related that, after having in vain sought for this fountain through many a weary day, certain travellers arrived in Canada, sailed up the St. Lawrence, and one evening, as the shades of night were darkening the landscape, at last reached this little stream. They drank freely of its waters, and in the morning, when they awoke, they sought for one another in vain. They had all recovered their youth, and could no longer recognise each other!

I recalled this legend, some time ago, as I was visiting the factories round Yamachiche and in the rear of that place, and I said to myself: Decidedly, these cheese-makers must have tasted some Water of Youth, must have found something that has restored their early vigour, something that we have not in our parts.

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I congratulate you on having that "something" which enables you to surpass the makers of other parts of the province. I am glad that, under the impetus given by my friends Fisher and Foster, the dairy-industry has in these latter days received a fresh development; and that, more particularly, owing to our following in the footsteps of you, gentlemen, of you, the association of the Dairymen of the Province of Quebec. This idea of the organisation of syndicates springs from your association, and we have only imitated you. I congratulate you on the progress you have made. It is you whom we follow; not the Ontario people.

After all, the difficulty does not lie so much in the making of good cheese; I know that yours is as good as the Ontario cheese. But it is not only the difference in quality that makes the difference in price. Allow me to cite a fact to show this.

One of my friends, in Nova Scotia, took it into his head to establish some factories, and with this view he came to an arrangement with eight factories managed by people from Quebec. The cheese he made was such that it took possession of the Halifax market. The reason was not far to seek: it was the first good cheese the Haligonians had ever eaten! All the cheese coming from the Province of Quebec had been ordered from Montreal, and on enquiry I found that this inferior cheese that was sent from Montreal as being the manufacture of the Province of Quebec, in reality came from Ontario! (Laughter).

The Ontario folk have a combination which enables them to put all their cheese on the market as "gilt-edge." They send all their inferior cheese to Montreal, and when the Nova Scotians or other people ask for cheese, it is sent eastward as the make of Quebec.

You also, then, must combine, if you wish to get rid of your bad cheese, and send it to Halifax or St. John, as the product of Ontario. (Laughter).

M. TACHÉ—I have been requested to submit to you the following resolution on the project of the syndicates: this resolution is proposed by M. l'Abbé Chartier, supported by M. le docteur Bruneau:

"The members of the Dairymen's Association of the Province of Quebec, in convention at Sorel, beg to express their earnest hope that the Government of Quebec will continue its kind assistance and encourage the establishment of syndicates of cheese and butter factories inaugurated this year; the association accepting *this* as fulfilling all the essential conditions of the programme adopted last spring by the Department of Agriculture. The president, officers, and directors of the association are instructed to communicate this desire to the Hon. the Prime Minister and Commissioner of Agriculture.

On the president submitting this resolution to the convention, it was carried unanimously.

M. NARCISSE METTEZ—Remarks have been made on the modes of making butter and cheese, on the formation of syndicates, &c., but, in my opinion, an important question has been forgotten or at least not discussed. I should like to know, Mr. President, if the convention intends to take up the question of *the sale* of butter and cheese. I think this is the principal point to-day.

M. HERREBOUDT—I, also, intend to say something on the question of the sale of butter, cheese and eggs. I am a Belgian, and I am desirous of establishing a direct trade between Canada and Belgium.

You have just lost a market, that of the United States, a very important market for the sale of your effects. I think we can offer you one equally advantageous, if not more so. I can show by statistics—I have them handy though not here at present—the importance of this market with which you, perhaps, are not acquainted. I, therefore, request those who are interested in the matter to attend the session to be held this evening.

On the subject of the election of officers of the association, which took place at the close of the afternoon session, we extract the following from the report of the meeting published by the *Sorelois*:

When the time arrived for the election of the vice-president, M. l'Abbé Chartier, agent for the seminary of St. Hyacinthe, who occupied the position last year, declined re-election on account of his health, and proposed the name of our fellow citizen, M. le docteur Bruneau, speaking highly in praise of that gentleman; praise that was well deserved.

M. l'Abbé Côté warmly supported this proposition, and the president, M. Bernatchez, was also delighted to recognise the merits of M. Bruneau, in whose favour the voice of the meeting was unanimous; but moved by a sentiment of delicacy, and with a feeling that did him the greatest honour, M. Bruneau requested that the choice of the convention might fall on M. l'Abbé Montminy, showing how great an addition to the influence of an association like this the presence of a member of the clergy among its chief officers would be.

The meeting yielded to the arguments of M. Bruneau, and the Abbé was elected vice-president.

A list of the officers and directors elected will be found in the minutes of the meeting.

N. B.—Since the meeting was held, the directors of the association have been actively engaged in advancing this question of syndicates, which is now settled, to the great advantage of our dairy industry. At the end of this report, our readers will find the texts of a law passed at the last session and of the programme adopted for the working of the syndicates. A bulletin containing these documents has been printed and circulated; copies may still be obtained on addressing the secretary. This bulletin contains information which will be found useful by all those who desire to organise syndicates in their districts.

ENSILAGE.

REMARKS ON THE WORK OF THE EXPERIMENT-STATION, BY M. L'ABBÉ CHOQUETTE.

Mr. President and Gentlemen:—

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

The question of ensilage, you will not be surprised to hear, has occupied most of my time during the past year. As you all know, this question is one

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of the greatest importance. It forms the subject of daily conversation among the farming class, and it has been placed by our legislators among the questions that are worthy of occupying their attention.

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

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

Ensilage has been called a *conserve*: the word is pretty correct, it has been properly applied, in this sense, that, first, it is a word well understood, and, next, that it designates a manufactured article. For this reason, I think it ought to be retained. Still, it is not quite correct; for ensilage is not a thing in a preserved state; it is not a fruit preserved in a closed vessel, in an antiseptic medium; it is a substance in a state of decomposition, and the decomposition is even active.

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

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

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

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

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

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

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

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

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

But if the silo be open, if the air gets into it in quantities, then the two ferments will work at an enormous pace, and in a few days they will have lived their lives. Then, in their place, you will find another ferment, not nearly as desirable, that is called the *rancid butter ferment*, and your ensilage will be spoiled. It will impart a disagreeable, characteristic odour that every body, who has been unfortunate enough to lose in this way a large quantity of ensilage, will easily recognise.

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

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

I said, moreover, that there exists in the silo both fermentation and combustion. Consequently, there is a loss. You must not be surprised at this,

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you will first admit that these ferments I have mentioned, living in a nutritive medium, will begin by providing for their own wants, and then, part of the silage will be used up (*consommée*), or if you prefer the word *consumed*, since I have compared fermentation to combustion.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

M. L'ABBÉ V. P. COTÉ—They are sometimes adulterated.

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

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

M. CHOQUETTE—We cannot say that as a general thing. In the spring, I intend to prepare small parcels of chemical manures of, say, ten pounds weight, and to send them to certain districts where we think the land is nearly homogeneous in composition, and the effect that they are shown to have on these soils will be, I think, the same that may be expected from them on a more extensive scale.

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

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

Mr. P.

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THE TRADE IN DAIRY-PRODUCTS. (1)

M. HERREBOUDT.

Mr. President and Gentlemen :—

I promised you just now some statistical figures. I am not going to deliver a lecture, or to make a long speech: I am about to give you certain pieces of information whence, I think, you will be able to derive profit in a commercial point of view.

It is not enough, gentlemen, to produce good cheese and butter, plenty of eggs, you must know where to sell them, and I believe that this is the immediate aim of each one of you.

Now, we have learnt in Belgium, that Canada's most important market has just been ravished from her; and, on the other hand, we, in Belgium, are searching the whole world for producers to furnish us with food-products.

You are not perhaps, gentlemen, acquainted with that little country, very little; it might even be called microscopically small, in comparison with your immense territory of Canada. Belgium, in fact, is only about one 340th part the size of Canada, and this little particle of land is occupied by a population of 6,000,000; one million more than subsist in Canada. To give you another comparison, the counties of Rimouski, Bonaventure, and Gaspé, inhabited by 54,000 people, are just about as large as Belgium.

Imagine then how dense must be the population this little patch of soil feeds and sustains. And you will the more easily credit me when I tell you that we buy from abroad more than \$130,000,000 worth of food-products. Now, we search for these products all over the world. I have here the official statistics, but I will not weary you by quoting the figures, which, besides, you would find it difficult to bear in mind; I have shown them to some of you, and I have made them see that, especially with regard to butter, we purchase from abroad for about \$6,000,000 a year, of cheese about the same amount, and that we pay for eggs more than \$20,000,000; that we get eggs from all parts of the world, including British India, but that none come to us from Canada.

This, I think, is an absolutely abnormal state of things. And what is the cause, gentlemen? The sole cause is that between Belgium and Canada, there has been, up to the present time, no direct commercial intercourse; that we each have always been represented by an intermediary between us: the English commission agent.

A remarkable fact, incredible I fancy to most of you, is that this immense quantity of food-products which we buy from all parts of the world, especially as regards eggs, an enormous number of which come to us from Russia and Italy, is destined to go to England, and serve to supply the London market. On the other hand, your cheese, especially, comes to us in Belgium, but after having passed through the English market.

(1) N.B.—The information contained in Mr. Herreboudt's remarks for private ends, rest entirely on the responsibility of their author.—THE SECRETARY.

And would you like to know what happens? Just now, you were shown that there was a difference between the Canadian cheese made in Ontario and that made in the Province of Quebec. Now, the Canadian cheese from Ontario is sold to us, Belgians, as English, as Cheshire; and the Quebec cheese is sold in England, and rarely in Belgium, as cheese of the very worst quality. In order to pass off this swindle, which I point out to you as a fact I have proved myself *de visu*, the cloth is removed from around your cheese, and it is thus made to pass for Cheshire.

Now, gentlemen, an accident taught me, in Canada, what Canadian cheese, that I had never really tasted, actually was. I was at Gaspé, a few weeks ago; a ship laden with 40,000 boxes of cheese had been wrecked in the neighborhood. Part of this cheese was sold there, and I recognized the inferior Canadian cheese that is sent to Europe.

And who is the cause of this fraud? Is it the maker? Nothing of the sort, gentlemen; I believe it is the merchant, the middleman. It is a matter of indifference to him whether you make good or bad cheese, so long as he gets plenty of it, and can make his own cheese fetch a better price by abusing the product of foreign countries.

Well, gentlemen, I came here to tell you in the name of the Belgian trade, that itself furnishes supplies to the English market: deal directly with us; send us your best goods, and no others. We won't deal stingily with you, we will even pay the highest market prices; but the best qualities we must have.

It must seem strange to you that we come in the name of Belgium to ask you to send us cheese, while it is well known that the cheese manufacture is in a very advanced state in that country. Here, gentlemen, is the explanation of this phenomenon: at the same time that we send cheese abroad, we require some for our own consumption. As cheese is a (*produit de luxe*) superfluity, which is not an article of prime necessity to the subsistence of the people, as it is produced for the use of the wealthy, we have succeeded by our industry in perfecting this article and in producing cheese fit for the table of kings (*fromages de luxe*): Camembert, Roquefort, Hervé, which last is essentially a Belgian product. Now, we have so encouraged the manufacture of cheese and developed it to such an extent, that most of our farms are real factories, and in the greater number of them the farmers are skilled in the manufacture of these different sorts of cheese.

But, in order to make them, we are obliged to work with raw materials that are not equal to yours. Ah, gentlemen, if you could teach us, or if we had it in our power, we, Belgians, to work in your country, with your raw materials, we would produce a fromage de luxe, that would beat all Europe.

On this point, gentlemen, I would ask the meeting to allow two of my fellow countrymen, agricultural engineers with diplomas, to address it. One is from our agricultural college at Gembloux, the other from our catholic university of Louvain. The university of Louvain, the *alma mater* of Europe, as regards science, has, annexed to its courses of medicine, law and theology, courses of practical agriculture, and notably a school for teaching the best methods of making cheese, butter, and all the products derived from milk.

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There, they give the diplomas I heard asked for just now. These gentlemen will tell you how this practical instruction is organised. To resume my purely commercial mission, gentlemen, I beg to ask you frankly one question :

Will you deal directly with Belgium ? We are prepared to take all the butter, eggs, and cheese that you can produce of the best quality. The Belgian market, I can prove by irrefutable statistics, is extensive enough to take all you can produce. As to technical knowledge, for determining the quality of your goods, you will nowhere find better judges than in Belgium. Of this, I will give you a striking proof.

I have about me a letter from one of our great dealers in butter and cheese, doing business with London. I invited him, some time ago now, to make a trial of Canadian goods. He did not reply to my invitation, but, lately, after what took place in the States, he wrote to me, and I will read to you a paragraph of his letter, which seems to me very interesting.

This is what Mr. de Winter, a great importing merchant at Ostend, having an agent in London, whose market he daily supplies, says : "Canadian butter has been sent to London, but it does not suit that market ; it is too fat, that is, too rich, and will only fetch half the price of ours. I had a great quantity of it, and had to sell it at a very low price. In spite of that, if you can send me a sample of a lot of fifty *kilos*, or a hundred *kilos*, to make a fresh trial of it, you can do so."

You see, then, that it is not enough to make first quality goods. The butter you make is fat and rich ; for that reason it is not acceptable on all markets, and notably not on the London market, since a butter differently made, in accordance with the taste of that market, butter which is less rich than yours, is worth twice as much. These, gentlemen, are facts that I assert to you, and if any one desire to be convinced of it by experience, he can accompany me thither.

M. de Winter continues : "As to Canadian eggs, they have always sold well at New York ; but since the establishment of prohibitory duties, it may be they will have to come to Europe. All depends upon the freight : if they have to come *viâ* Hamburgh, like the fish, there will be no chance of making a profit." Here is the explanation of this passage. Last year, I profited by the last departure of the steamer of the Hansa line for Antwerp, to send a few samples of fish. Now, the boats of that line only go to Antwerp after having served Hamburgh. It happened that it was the last voyage of the season, that is, the boat did not return to Montreal. It remained at Hamburgh, and I received notice that the fish was at Hamburgh, and could only be forwarded to Antwerp the next spring. The fish, therefore had to be sent on *vi* London, and there was no longer any profit to be made. "Sent to London, or to Antwerp, at reduced rates, one might do something. If you send to London, you may address me a box, as a sample, directed to Mr. James Murray, (the name of this gentleman you have seen in the papers as an importer of English goods ; well, gentlemen, he is the agent for a Belgian firm), on condition that you get favourable terms for freight. The box should contain 668 eggs well packed : if not well packed, they will arrive in the omelette-state."

"When this sample has been seen and examined, we can take hundreds of boxes weekly."

There, gentlemen is a market open to you; all that is asked is that the quality of the goods be first-rate and the carriage easily managed. As to the carriage, I thought I ought to get the necessary information as soon as possible. Up to the present time, starting direct from Montreal to Liverpool and thence to London, the cost of freight made the Belgian market indeed inaccessible. I thought there must be some more direct line, and at last I found a line running from Halifax to London. Here are their charges for freight. You will easily see that they do not lay more upon the goods than they can bear. "The freight of goods will cost you, "say the agents of Pickford and Black," as follows: a box of eggs, per ton of 40 cubic feet, 15s. A package of butter, per ton of 2240 lbs., (what we call a gross ton), 22s. 6d. (one shilling per 100 lbs.), A box or case of cheese, per 2240 lbs., 22s. 6d. A barrel of poultry. . . ." I understand, gentlemen, you have an excellent plan here for preserving your poultry in winter, when you want to send them away and not to have to keep on feeding them. You kill them at the beginning of winter, and pack them in barrels with snow or ice. I said to myself: This is an excellent means of conveying poultry to market. If it is not too costly, as it freezes also at home, they will reach us in a perfect state of preservation. Now, the freight costs only 2s. 9d. per barrel! Do you know that the turkeys you sell here for 50 cents are worth \$2 in Belgium, and \$3 will at an early date be paid for such in London. There you have the market prices, in London and in Belgium, for produce you have never dared to send thither, because you thought the freight would cost too much. You see that now you can send butter, cheese, and poultry, and how little the freight comes to.

Belgium is then the new market open to you; it is for you now to take possession of it. We, Belgians, have done all in our power to aid you; we have found out the price of the goods, the cost of freight, and we ask you now to furnish us with samples, samples that we do not ask for from middlemen, from commission agents, from dealers, but we ask for them direct from the producers.

We know perfectly well that the samples we shall get in November and December will give us no idea of the goods you can furnish in July or August. We know how to distinguish; but they will give us a proof of what you are able to produce. And, gentlemen, I can assure you that from the moment these goods are found to be fitted to the European market, we shall be in a position in the very next season to offer you contracts as important as those that you used to get in the States. One last remark: we do not ask you to send us merchandise on consignment. No, gentlemen, we repudiate that system. Belgium will never again, if it has already done so, ask to take your goods on consignment. We shall come and take delivery of your goods here; we shall accept them here; they will be paid for at the port of embarkation, and once on the ship, they will travel at our risk and peril.

If, under these conditions, you think fit to form relations of commercial intercourse with us, I place myself at your disposal. I intend to stay in this country until December 15th, and until then, I am at the service of all those who wish for information. I am publishing in "La Presse" a series of letters, but only dealing with the general subject; and those who read that paper may

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see what Belgium has been doing for some time to form commercial relations with Canada, and what she is still disposed to do to increase them and make them more productive. I have done.

M. NARCISSE METTEZ—I should be glad if Monsieur would tell the meeting what sort of butter he wishes to have.

M. HERREBOUDT—This is, indeed, a most important matter. It had escaped me. We want fresh butter; perfectly fresh, without an atom of salt, and this is the reason: when I mention the Belgian market, I am speaking of the markets of all Europe; Belgium sends this butter to fifty different places, to France, Germany, Russia, and to England; now, each of these countries demands a different degree of saltiness to the others. Some of it is even eaten at once, and this must be absolutely fresh; the difference of price is enormous. Thus fresh butter is sometimes worth 6 francs a *kilo*, but when only a little salt is put to it, it will only fetch 2 francs. (1)

But you will ask me how to keep this butter. That, gentleman, is our business. From the moment that you hand us over butter guaranteed fresh, and packed as we require, you are free from all responsibility. We even know how to deal with butter that is a little damaged. Rancid butter is not rejected on the market. We have the means of curing this defect; and even this butter has one good quality: it is preferred for making certain special sorts of pastry, for which rancid butter is in demand, but it must not be salted. Don't trouble yourselves about the condition. We want you to send us fresh butter, and all we ask of you is that it shall be absolutely saltless.

M. METTEZ—Can M. Herreboudt tell us if it will suffice to take the same precautions that are taken to preserve the meat sent from Chicago to Boston in refrigerator cars? The meat is as sound when it reaches Boston as it was when it left Chicago. The gentlemen who are here, who are far more learned than I, understand doubtless these questions. For my part, I see no hindrance to our making use of the same means of sending our butter to Halifax, as soon as the boats will engage to employ the same precautions. As soon as Belgium will undertake to carry the goods on the boat at its own risk and peril, I see no reason why we should not make use for our butter of the cars employed for the carriage of meat; and I do not see why the butter should not reach the boat in good order, in spite of the cars stopping at each intermediate station.

M. HERREBOUDT—My colleagues will, on this point, give you all the information you require.

M. TACHÉ—One of these gentlemen is to address you to-morrow on this question: The preservation of butter. I have been requested to postpone till to-morrow the continuation of the subject now under discussion.

Six francs a kilo=40 cents a pound. A. R. J. F.

THE SILO AND ENSILAGE.

M. LOUIS BEAUBIEN.

Mr. President and Gentlemen:

I fancy the officers of that very useful institution called the Dairymen's Association are in the habit of indulging in treasonable practices with regard to your very humble servant. This evening, on my arrival, they attacked me at once with: "You will have to speak about siloes." Why I have been speaking about them for two years, without reckoning the innumerable copies of my pamphlet that I have sown broadcast all over the province. Don't you think these people want to satiate—I won't say to disgust—but to satiate completely the audience, who might be listening to something much better worth their attention than anything I can say on this ensilage question?

It is true the subject is very important, but I have seen you all often enough to know that you were present when I spoke before on this question. You will understand that it is embarrassing enough for me to have to repeat the same thing over and over again. I will try, gentlemen, to divest myself of this embarrassment, by telling you that what affords me the greatest consolation is, that ensilage is always good, always excellent, and that the more ensilage we make, the more we shall desire to make.

Since I must talk ensilage, I will say that during the four years I have been practising this pursuit, so important on account of our climate, I congratulate myself more and more; and every year, I repeat to myself that if each of my compatriots were in the habit of practising this system, we should for ever erase that movement of emigration which is decimating us, and all our farmers would be prospering. That cannot now be said of all of them, I fear. Had the system of ensilage not been discovered elsewhere, it must have been specially invented for the benefit of Canada, to help us to get through those seven months of winter that ruin us, that use up all our crops, in spite of our having watered them with our sweat during the five months of summer.

The invention of the silo is due to Goffard. I am an imitator, a plagiarist; I never invented the system; I copied him to the best of my ability; I sang the anthem throughout the country, and it seems people are never weary of listening to it. Well, gentlemen, when you have felt the value of this system, you will become its most enthusiastic apostles, and you will feel yourselves endowed with sufficient power to address this association on the subject of ensilage every year for the next fifty years to come. (Laughter.)

Gentlemen, with this system of ensilage, you have the means of getting in your harvest in spite of any chastisement providence may inflict upon you. Never mind hail or incessant rains, in the midst of the heaviest downfall you can carry your crop and pack it into the silo; it will be all the better for it. I have harvested ensilage, maize, when there were 8 and 9 inches of water

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in the furrows, thrown it into the carts, sent it through the cutter, and once in the silo, the silage was the better for it. Again, I have ensiled maize in splendid weather: it was no better.

You remember a discussion that took place a year ago, when M. Ross paid me some little compliments. He was with me as we were making our silage; he said: "What are you going to do with this maize, all drenched as it is with rain?" There was, as you may imagine some mud on it, too. "Your cattle won't eat it." Well, this silage was an improvement on that of the preceding year, when the weather apparently was far finer for ensilage-work.

Gentlemen, I am satisfied, after four years' experience, that we can have no better system in the Province of Quebec, and if we learn how to manage it, and how to make use of it, we shall blot out our winters, and make butter as good in flavour and of as fine quality as in summer.

Moreover, we shall be obliged to do away with the system we practise now in our farming—a ruinous system it is—we shall be compelled to grow fewer grain-crops.

By-the-bye, gentlemen of Sorel, I must beg of you to pardon the desultoriness of my speech. I have not had time to put my ideas in order, and I emit them just as they come. And I beg pardon beforehand for the want of consecutiveness that will appear in my observations. I will try to be practical. What I can say is, that with the practice of ensilement, we shall be able to continue to cultivate the soil of Quebec; otherwise we shall have to give it up. I explain:

We have to contend with the enormous production of the West. In that country, as you know, the land has not to be cleared. A colonist arrives with his horses, his cattle, does his ploughing, and in the spring everything is ready for the seed. So we can never contend with the products of the West: maize, wheat, oats, barley, pease. You will have to give up the cultivation of these cereals, for they will always be purchasable at so low a price that you cannot compete with their producers. You must, then, change your system of farming, or resign yourself to continue a system that will plunge you more deeply into difficulties every year.

We must look events fully in the face. This is the thought that occurred to me this year, as I was observing the poor crops we have had, particularly in the district of Quebec, but pretty generally everywhere. The harvest was not a good one, it was one of the worst we have had for many years; and you cannot sell oats, gentlemen, for two reasons: first, because there is not much call for them; and, next, because you have none to sell. (Laughter.) When you have good crops of oats, there will be still more in the West. Then, you clearly must change your style of farming.

Here, like a real Providence, comes in the silo, which will help you to carry on your farm with much greater economy. I formerly cited the case of a man who grew a patch of maize for ensilage, and put all the rest of his farm, which used to be in grain, under pasture, because, as he said, he had no means of paying for labour. He only grew enough grain to supply his family. Well, this man was able to do with half the labour he had been accustomed to em-

ploy, and his farm-products were greater—more milk, and of course, more butter and cheese.

This is the system that will have to be adopted; if we do not change our present system, we shall grow still less prosperous, we shall succeed even less than we do to-day.

It is for this reason that I insist on our adopting the ensilage plan. I will not now enter upon the details; all the world knows what they are, and I have said so much about them, that I no longer feel the same ardour inciting me to treat them at length. I will condense what I have to say in a few words.

There is your piece of land that you manured last autumn. When spring arrives you sow it and ensile the crop in the fall. You know how a silo is made; it is a vessel with both bottom and sides closed completely; a vessel into which the air can only enter from above. When the silo is full, cover it, and all is done.

When we began to busy ourselves about siloes, we thought they must be covered with boards and have stones on the boards. Well, that was in our babyhood. Things are changed since then. When this year I was about to cover in the silage, an idea struck me about a cover still cheaper than that used in the previous years. You remember that I told you, at the last convention, that I had a silo I had not covered at all. I followed the same plan this year. The cattle on entering their winter quarters continued to receive the same sort of corn they had been previously eating in the field. That silo was never covered, but the others had to be covered. When I set to work to cover them, I put about a foot of straw upon them, and then simply took some fresh horse-dung and spread it over all. The silage kept admirably, and you will see why immediately.

Do you remember how costly it was to cover the silage as we were told to do at first? But our experience has led us through a rough school, and see how far we have got; we no longer need stones or boards, we only use a foot of straw and this couch of fresh dung.

I have already raised this cover of my silage: it has kept admirably, the air having been completely excluded by this layer. See how the system simplifies itself every day! But the best of it is, that the more one advances the more one sees the possibility of further advancement, and when once one has made a silo, if one were compelled to give it up, it would be as much as to say that the exploitation of the farm could no longer be carried on.

See how necessary this system is in our country, where the winter is so long that during its continuance the whole produce of the farm is devoured by the stock! With a silo, what happens? There are my cattle that are dry: we give them 45 lbs. of silage-maize, mixed with straw-chaff, and nothing else. For the cows in milk, we add a little to their ration, and we give them a warm mash to keep them in milk. We no longer want hay: I don't make any; I grow no more grain. I prefer buying straw at \$3 the 100 bundles delivered. Well, do you see what an economical system this is?

If we do away with the silo, what shall we come to? We shall be back again at our contest with the West. Can we sustain this contest? Ah! maize is selling at a cent a pound, and cheaper still. We can't grow it at the price. Let

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us then, give up our old system: grain, and grain-crop after grain-crop. Let us carry out the new system which must be our salvation, since it lessens the labour-bill, and furnishes us at a cheap rate with what is needed for the support of our stock.

I intended, gentlemen, this evening, to insist upon the importance of my countrymen changing their mode of farming, and to arrive at that result, it is only necessary to beseech those who are at the head of the progressive movement to make silage. By this means they will be irresistibly led to change their present system of farming.

If you meet a farmer, ask him: "Does it pay to grow grain?"—"Ah, sir, we have no wheat this year, neither oats, nor barley, there is nothing this year!" (Laughter.) Well, gentlemen, I see you laugh: I rather think you are laughing at me; you speak the truth jocularly, and I, too. This is a cruel truth indeed, and a truth that we must look in the face.

How it pains me, when I see a grand convention such as that we have here this evening, to think of so many honest farmers, the most respectable part of the population, who are growing poorer and poorer every day. I say to myself: Have these people no intelligence, do they not deserve to succeed as others do? How is it that we cannot succeed? The reason is very simple, gentlemen; the people do not acquire instruction in one year alone. When I see the Scotch, the English, come hither from their island, where land is valued by the foot, where farming is *intensive*; when I see them come to Canada with their knowledge, their habits, I say to myself: It is not to be wondered at that they know how to farm; they were born in the midst of a population that knows how to farm. They bring their knowledge of farming with them, and they succeed.

How have our people—I speak of the mass of the population—gained their education? For the moment, I leave the question a little, but it is necessary to know how to account for what we see. Our population was abandoned here without leaders, obliged to make war at once upon the forests and upon the Indians. And the farmer in those days was not a farmer; he was a fighter against the forests, and a fighter against the Bostonnese as well.

This farmer, gentlemen, had he the time to teach his children how to hold a straight furrow? Had he time to teach good lessons in farming to his family? Had he time to teach himself? Ah! he had only one book open before him, he had only one book whose mournful pages he could turn over: it was the book of his poverty.

This, then, is the depth whence we have emerged! And I say to-day, that if we have arrived at our present position, we may be proud of it, and reject the insults and the reproaches with which we may be assailed for not having got on fast enough. We have quitted the abyss, the wretchedness, and it is only by unheard of efforts that we have arrived at the present result. No slight amount of intellectual exertion, of perseverance, gentlemen, have been expended to attain this end.

There have been devoted men who have told us: "Listen, Canadians, you must cut out your own road of progress; you cannot improve by calling strangers to your aid. To you, emigration is forbidden. You are not

fortunate enough to be able to learn, neighbor from neighbor; you are here, isolated in this cold corner of North America. You will have to instruct yourselves; to draw from your own womb those enlightened men of whom you are in need!" It was then that were formed those highly educated men, reared in our classical colleges, and it is to our clergy we are indebted for them. Well, I shall never cease repeating it; you all understand that perfectly familiar phrase; now-a-days, the clergy must change the step they have been dancing (*change de planche*). (Laughter.) I do not say, gentlemen, that the institutions of the higher education must be abandoned, but I say that the clergy must give us as farmers men of good education, and if they once interest themselves in this behalf, the work well begun will soon be well ended. I decidedly approve of what has been already done; but the movement must become general. Let them give us the farmer honest, religious, industrious, enlightened, as they have given us the intellectual, daring man of high education, and we shall be a perfect people. On one side, we shall have intellectual progress, on the other, sound, material progress: we shall have good farming.

Then, gentlemen, let there be no hesitation on the part of the clergy . . . and let them make ensilage. (Prolonged laughter.)

I am sure it is not Monsignor Labelle who will say: "What, the deuce, shall I do in that boat?" Monsignor Labelle understands me, and so does M. Montminy, and the clergy in general understand me. They don't hear me now, but my words will reach them.

I am going to preach you a sermon, gentlemen. When one finds in any part of the country a well to do farmer, I ask the members of the clergy who are present, if 90 times out of the 100 he is not an honest man, an example to the parish. I know the people; I won't pay you compliments, but I will tell you the truth. Take, in any parish, the farmer—I don't say the richest farmer, he, sometimes, is lending money at high interest—but take the farmer in easy circumstances, and you have found an honest man, the example-man of his parish, religious, and a man who educates his children properly. He is in an awful rage if he cannot make them priests, advocates, physicians; so much has it entered into the minds and habits of the people to bring up their children in such a way that the higher education may form them for professions. So long has this been preached to us, that the moment a farmer becomes at ease, he must always make one of his family a highly educated man. He, the farmer, has always been a ploughman, his ambition is that his son shall be learned, and able to address him little speeches, like that I am making to you at present. (Laughter.)

If we could put it into the heads of the people, into the heads of our good curés, to give us the man of good agricultural knowledge, as they have given us the man of high education, the Province of Quebec would become prosperous. There would be no more emigration, no more need of sending cheese, even No. 2 cheese, to England, not at all; we should have perfect prosperity, and our parishes would be rich. We must come to this, and to this end our curés must make ensilage. I know all about this from experience. If you knew how many letters I have had from curés, showing intense devotion to the interests of their parishioners! "Sir, I beg you to tell me what to do; my silo is in

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danger of perishing, and if the contents rot, the system is for ever dead in this parish. Help me at this critical juncture; save the silo and the position is saved."

Well, one of these curés, like many others, had no land, not even a village-lot. But he said to himself, in probably another form, what I said to you just now: if I had a farmer to set the example to others, I could do a great deal of good to my parishioners. Then said this curé to himself: If I can't find any one else to do it, I will do it myself. He got one of his people to sow and harvest a piece of maize, he ensiled it, and watched over it; when he saw the silage begin to heat, he slept not. It was the first time he had ever made silage, and he did not know how to set about it. The walls of his silo let the air enter on all sides: success, you see, was impossible. But since that time he has succeeded to perfection, and he wrote to me this year: "There are ten siloes in my parish." Well, gentlemen, there are ten farmers saved from ruin. He who has made a silo won't be without one; and those who make siloes are always sure of their business succeeding.

Here is a farmer who has 25 cows, and not enough to winter them on. Were I say to him: I will winter your cows for you and hand them over to you fat in the spring; do you think I should be doing him a service, and that he would be convinced of it? Well, that is what the silo will do for you.

With an *arpent* of land you can winter five head of cattle. I have said as many as seven, and it has been done, too, but I have not yet arrived at such perfection. Do you think that can be done with an *arpent* of roots or of grain? By teaching people to grow maize for silage, we teach the way to winter stock for almost nothing. By showing farmers how to make silage, we render them a very great service.

As it is getting late, I will not detain you much longer, but I have brought with me some small plans (*images*) that I wish to show you. You know what a stern winter we have in Canada. I am about to speak to you on another point, but one still that is connected with ensilage. You know how long the winters are, and how we need good buildings to shelter our cattle during these long winters. We are not in the position of those lucky countries where the stock can be left out all the winter, or, at least, be merely kept in sheds of light construction. Ours must have warm abodes, for, the less warm they are the more food the animals will consume.

Look around you, gentlemen, in the Province of Quebec; what sort of farm-buildings are to be seen? In the district of Quebec, in that of Montreal, in the district of Sorel, you see the buildings all of one story; and, in consequence, you have buildings of from 100 to 150 feet long, by the side of another of 50 feet, another of 25 feet, and so on. The man who attends to the cattle during the whole winter, is obliged to go from building to building, and to leave the cow-house to get water and fodder from another building.

This system gives the farmer double work, and will certainly cost him in labour twice as much as a building where all his stock could be lodged under the same roof.

I thought, then, that I might be rendering a service to the farmers in drawing out a plan which I offer for your inspection, and which consists in con-

The new you have printed this paper I shall be pleased to see.

structing a building where everything is collected under the same roof: cattle manure, and the silo. If your land is hilly, you will erect your building on the slope of the declivity, and there will be only one story: you can enter from the level into the upper story from the front, and equally from the level into the lower story from behind.

I have had to build extensive stables for the Haras Company. After they were erected, I thought I would make use of the little experience I had gained to make this plan. I gave all the dimensions, Mr. President, to my architect, who drew out this plan which I am happy to present to you. I have had a thousand copies of it printed, and I have distributed them among my friends, the members of the Federal Parliament, the Senate, the Legislative Council, the members of Parliament, the presidents of the Agricultural Societies, the presidents of the Agricultural Clubs; and I propose to present them to this meeting.

I will not say that this idea is perfect, but I believe it to be an improvement on what we generally see. The silo is so placed that its bottom is on the same plane as the horned stock.

In the lower story, there are manure pits, which are inside the building with ventilators to prevent the effluvia of the manure from harming the cattle; and the loose boxes, in which the young rearing stock are kept, are also on the lower story, as well as the root cellar. The poultry-house is placed in the warmest part of the building; at any rate, in that part that will be first in the spring to be warmed by the sun.

If any of you, gentlemen, desire to make use of this plan, you must take care to make no alteration in the cardinal points; *i. e.*, the edifice must be placed in the position it occupies in the plan, in order that the west wind may not strike the building on the open side. In winter, when the wind is east, it often brings snow, but rarely great cold. Our greatest cold generally comes on the wings of the west wind. On that side the building is closed.

The bottom of the silo is on the story (floor) higher than this depression, that the silage may be carried in barrows directly to the cows, without your being obliged to go up or down stairs. This is very important, for you will have to keep your cows on ensilage all the winter, and dealing it out will be the principle work of your cattle-man.

On the principal floor are the stables and cow-house.

With economy this building can be put up for \$700. There are not many farmers whose building are not worth \$700, but they are in separate structures. You will be a great gainer if you can put everything under one roof.

There, is the threshing floor, on which you do all your threshing in winter; and the hay-lifter (*fourche*), which allows you to fill your barn up to the very top.

Lastly, I believe this plan can be of service to any one of my friends, the farmers. I do not want any credit for it. I offer it as my contribution with great pleasure. I consider it as my quota added to the labour of the association, and you may make your arrangement with the printer as you please. I will lend you the stone, and you can have as many impressions struck off as you want. The more you have printed, the better I shall be pleased.

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M. Mercier seemed to be inclined to have some thousands of copies printed. I myself have distributed a thousand. I do not ask for a half-penny of profit. Let them be distributed among the different societies. What I should like would be that a sufficient number be printed (there! I am speaking in the name of the government, just as if I were a minister), to send some to each curé, so that this plan might be placed in the hall where the *habitans* assemble.

Those who wish to rebuild after their barns have been burnt down can profit by this plan. If we could erect a hundred of such buildings as examples to the province, I think we should be rendering a great service to the country; and that the farmeries would improve step by step.

This evening, my friend, Mr. MacPherson, as we were travelling together from Montreal, said to me: "Do you know where good farming should make its first start?" "By good ploughing," replied I. "No," replied he, "by building a good, improved barn." He added: "How? you farm your land well; you get good crops, that you give to well selected cattle, and you keep them in a building where half the food will go to waste, destroyed by the cold."

You see I agree with Mr. MacPherson since I set before you this plan of a building that I feel able to recommend to your notice. Now, it is not an invention of mine; I visited many farmeries before I built mine. And I picked out, right and left, whatever seemed the best. I have not patented my plans, and you will not be sued for damages if you make use of them.

Now, Mr. President, my address I know has been a very discursive one; it is your fault, I have done my best. The chief thing for me, gentlemen, is that I have contributed my share, and that I have brought, not my grain of salt, but that little work that I am fit for to your assistance. This is the third successive annual meeting I have attended, and I hope I shall be able to attend as many more. I only wish I had been present from the very beginning.

Thanks, Mr. President, for having asked me to address you. I beg my kind auditors to excuse me.

ADDRESS OF MONSIGNOR LABELLE.

ASSISTANT COMMISSIONER OF AGRICULTURE AND PUBLIC WORKS.

Mr. President and Gentlemen.

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

I felt that our forefathers, possessing a virgin soil full of the unexhausted riches of its original fertility, had been the spoiled children of Nature. When

a soil is new, you know that it will grow anything you want, and all you have to do is to tear open its bosom a little. So that the soil is more crafty than its master. (Laughter.) But to-day the time has come when the master must be more crafty than the soil. (Laughter.)

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

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

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

But that is not all; to get the land well worked, I advised my farmers to put in potatoes, because, with the implements we now have, it is easy to cultivate them. For at the beginning of improved systems we must not attack too difficult things; we must ascend gradually. To have good crops of vegetables, the land must be well hoed, and I found that this could more easily be done when potatoes were the crop, and with greater profit, without mentioning other sorts of vegetables; for you know that suburban proprietors make more money out of vegetables than those who are at a distance from towns. But what happened? First came that hateful potato-beetle; my plans were pretty thoroughly flooded! (Laughter.) All at once, a poison was discovered to kill these horrid brutes; then I announced, from the pulpit, my first great victory over the potato-beetle. (Laughter.) But just imagine what opposition I encountered! There was a man who, at the very door of the church, exclaimed, that people must not pay attention to me, because Paris-green would poison all the cattle; that, in the parish of St. Augustin, a man had sprinkled his potatoes with Paris-green; a storm came on; the rain ran into the ditches charged with Paris-green; his cattle had drunk of this water; and they were all dead. This tale went from house to house. It was all a lie; it was the man's sense alone that was dead: but I was to some extent its victim.

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

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you think this calf was worth? \$200. I gave it in charge to a farmer, telling him to take the greatest care of it. And, oh, the instructions I gave him about it! I did not quite tell him to get a cradle for it, but very nearly! (Laughter.)

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

But something occurred, gentlemen, which gave a great impulse to the progress of agriculture; this was the establishment of the Dairymen's Association, of which M. Bernatchez is the president, and of which you see so many members met here to-day. You can form no idea of the good that this has done. Seeing M. Taché present, I cannot refrain from offering him my grateful thanks for the zeal he has shown in this respect. His talents are, indeed, very remarkable; he has devoted all his intelligence, all his acquirements, to the important question of the dairy industry. We cannot do less, gentlemen, than thank him for it.

You know that to get a good flow of milk from the cow's udder, a good lot of food must go into her mouth. This law admits of no exception, and unfortunately, we are in the habit of feeding our cows insufficiently; we do not value them highly enough; we do not know what profit they are able to afford us. Nowadays, all the markets of the world have been altered by steamers and railways; it follows, then, that our farming must be altered, if it is to be made more profitable. If the man that sows an acre in oats, reckons up the whole cost of the seeding and harvesting of this crop, all the food and labor it has consumed; I think, he will find that he has not made \$1 a day; there are laborers who earn more than that. We must, it is true, as much as possible draw from the land all that is required by the family and the farm-stock; that is the great secret.

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

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

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

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

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

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

Just see all that can be got from your cows. It is incredible! Our cows are will our fortune, and it is they that give us honey on the earth. Our country is a fine country, remember; *allez!* I was reading Josephus, the historian of the Jews, in that part where he describes the country that God gave to the Jews, a country flowing with milk and honey. Well, remember that Judea, after the description of Josephus, is like our own country: it abounds in mountains, in fine forests, and in streams. I thought within myself that we were as fortunate as the Jews, and that God had chosen this land of Canada as expressly for us, as he chose Palestine for the Hebrews.

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

Well! In a country like ours, so fit for cultivation, with the sea so near, that is so to speak, on the very borders of the sea, do you not think that its

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

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

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

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

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

M. BEAUBIEN—We must always take the ball at the hop: I would, therefore, propose that M. Labelle kindly carry out his idea of insuring the construction of a silo in every parish. He told us he intended to gain this result by offering a prize. I see that a committee of the House has been appointed for this object, at least, this is one of the principal ends it intends to secure; the construction of a silo in every parish. I beg Monsignor to be good enough to make use of the influence he has with the members of the House, to realise this project of prizes in favor of those who shall build siloes in every parish, and that the prizes shall be distributed by the parish priest. In this case I shall deserve the title of the father of the silo. I don't deserve the title, but it has been conferred upon me and I accept it.

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

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

IMPROVEMENTS TO BE MADE IN THE DAIRY-INDUSTRY OF THE PROVINCE OF QUEBEC.

BY M. M. E. MACCARTHY.

Mr. President and Gentlemen,

You have requested me to deliver a lecture on the improvements that require to be made in the dairy industry of the Province of Quebec. It is with very great pleasure I yield to this request.

Still, before I reply to this programme which flatters me highly, may it be permitted me, a stranger, called to the midst of this important convention, to have the honor of sharing in its labor, to salute it with the expression of all my sympathy and of all my best wishes for the prosperity of the national industry it represents, and to the defence of whose interests it devotes itself with so much ardor. I offer my compliments also to the citizens who, at your head, have had the courage to contend against mistakes, prejudice and routine; the one by creating the Dairymen's Association, the other by bringing to its aid their indisputable and undisputed knowledge; so many valiant pioneers, so many devoted apostles, whose names are inscribed before hand in the Golden Register of your beneficent association.

Among them I know some who have given themselves up wholly to the expansive progress of the association, and who have consecrated to it their entire good will, the larger share of their labor, and all their prospects; others there are who have brought to it the precious co-operation of their practical experience, and who thus assist powerfully the development of the vital strength of the dairy industry of Canada. Honor to all these men of good will and energy, who have had at heart the future prosperity of their country.

Permit me to sum up here my admiration for their cause in these words: they have deserved well of their country, and their place is assigned to them in the Pantheon of its industrial future.

The future of the Province of Quebec—old French Canada, how beloved in the mother country—its future, I say is, I am convinced, intimately bound up with the future of the dairy industry, one of the chief, if not the very chief of those she is carrying, or even that she can carry on. It is true, you have forests still productive, rich mines, but their results are of local interest (*loca-*

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lises); the forests here, as in Europe, will some day be exhausted, the mines may some day cease to pay, but that which the dairy industry offers us is inexhaustible; it will be for all times, and I can say with the profoundest confidence, it will be some day the chief element of the wealth of this vast country. You are not laboring, gentlemen, for yourselves alone, but also for the future of generations yet to be born, in developing your dairy industry, and in taking from this very moment the place that belongs to a people brave and determined to succeed by its courage, by the enlightened minds of those who have taken for their mission to direct it, and who would prove to the world that on this land, so long and so ungratefully abandoned, there still exists a people full of vigor.

Allow me to add that, as a Frenchman, I am proud to address these praises and good wishes to an audience chiefly composed of the descendants of Frenchmen, whose sentiments have remained so firmly attached to the ancient fatherland of their ancestors.

In describing myself, I ventured just now to call myself a stranger, and I feel almost sorry I did so; it would, in fact, be unjust on my part not to be grateful for the warm reception I have everywhere met with since my arrival, as well in official quarters as among the most humble of the working class. This encouraging reception, as well as the reception I have just experienced here, make me almost regret, as I said, that I called myself a stranger. I will even add, that if there were not a profound abyss, in a political sense, between my country and yours, I would at once exclaim with enthusiasm: "Frenchmen and Canadians are both one: I am ever yours."

Forgive this long preamble, gentlemen, during which I could not entirely overcome my patriotic sentiments, and allow me now to attack the question it has been assigned to me to treat before you.

On casting a look on the past, I see that only ten years have elapsed since the dairy-industry in Quebec was still in the state of a problem. Since that time, you have entered resolutely on the road of progress; separator-dairies have been established at many points; the mode of making Canadian cheese has been sensibly improved, thanks to earnest efforts, due in great measure to Mr. D. MacPherson. Agricultural lectures, wisely written, notably by your eminent colleagues, Messrs. J. C. Chapais and Ed. Barnard, have broken up the ancient routine by degrees, and many intelligent farmers, profiting by the lessons based on the experience of these devoted leaders, have improved their system of cultivation and given more care to the feeding of their cattle. This result soon made itself felt. The breeding of your cows promptly began to show an improvement. This good Canadian cow that has endured such rude trials and which in spite of them has remained so good a milker, has not been slow to give the best results, and, thanks to the intelligent practice of *selection*, she will soon be classed among the best in the world. Under these different influences, the milk has increased in quantity, and by degrees the quality will improve in proportion as the food given is increased.

As to the manufacturing part of the story, alongside of the praiseworthy efforts of private individuals, an important association was formed some years ago to carry on separator-dairies. To its appeal, the farmers replied with confidence, and if it was unsuccessful, that was due solely to a lamentable occurrence which I need not recall here, except with a view to be faithful to history.

This very year, the firm of MacPherson and Taché has had the praiseworthy courage to occupy this sad heritage, and to struggle throughout the whole season against the discredit it had occasioned. Perseverance and sacrifices have not been wanting on this occasion, and after a year, laborious from all points of view, victory has been won, since I can say with truth that confidence has been restored.

The new firm has had, however, to bear up against prices for butter that, up to September, were absolutely ruinous, a fact by no means calculated to give satisfaction to the industrious farmers, already discouraged by the losses caused them by the former firm.

Much progress, then, has been made during the last ten years, much good feeling has been manifested, many sacrifices, even, have been made; and still,—must I say so? you are, in my opinion, only in an almost embryonic state.

In fact, the food given to your cows is not, in general, enough for them; they suffer in winter because food is not reserved to supply them with sufficient nourishment. If the pastures have been improved, the animals hardly profit by them, except in summer and part of the autumn; but the winter arrives, and the feeding in the sheds is almost everywhere insufficient. Now, it is just at that season that the milk should be called upon to yield you its greatest profits. Of this we have an evident proof in the herd of the Convent of the Sacred Heart at Quebec, that gives such a large yield throughout the year.

Treat your herd like that one is treated, keep the winter-yield in view, make provision in the silo for that season, and it is only then that you will obtain results really valuable. Do not moreover neglect the demands of the cow to be kept clean; and know for a certainty, that she will return you a hundredfold for the little trouble you take to feed her properly, for then, her milk will be both rich and abundant.

Besides this, by feeding your cows well during winter, you keep them in good health during the period of gestation, you prepare them for the spring-milking which, under the present general conditions, is relatively unproductive in proportion to the hardships the cow has suffered in the previous winter. Now, any animal that has suffered privations during the arduous period of pregnancy, cannot, on one side, produce a fine offspring, and on the other, yield a milk satisfactory in quantity and quality, until it has recovered the plenitude of its forces. A cow whose health has been injured by want of care and poor food during winter, cannot, then, in spring give satisfactory results in milk, until after a certain time passed under the influence of the restorative diet of summer.

I would also call your attention to the selection of your breeding stock:—I have often seen very mean looking bulls in this province; they cannot beget good stock. If it is desired to improve a breed—and yours deserves improvement—we must begin by making a careful selection of both sire and dam; this is the whole meaning of “improvement by selection.”

There, you have a rough sketch of the progress that I consider as indispensable as regards breeding, and that is the starting point in the dairy industry, since the cow is the source of the milk.

I will now attack the industrial side of the question: There, I see many things to be done!.....

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And here allow me to make a short digression. When I arrived here from Europe, I was told: "You will see how much less money we spend than you do at home in fitting up our creameries!" To this criticism I listened without saying a word, promising myself to make good use of it if there was an opportunity, but also determining to observe and compare. Well, my opinion is formed. I ought to know something about the dairy industry in France, and I affirm that if the results obtained there are superior to yours, it is caused in great part by no precaution being neglected to attain the desired end. France grudges no really necessary expenditure, whether for perfect installations, or for suitable payments to well taught and intelligent workmen.

Her factories are generally built with good materials, and with protection to keep off the great heat of summer as well as all kinds of bad weather. The apparatus and machinery are set up by specialists, that is, by competent workmen, and not by the first comer, as too often happens here. Besides, water, so essential a factor in the dairy, is in every establishment there considered a matter of the greatest importance. People never grudge the cost of sinking a deep well, if necessary, in order to obtain an abundance of pure, very cold water. Every one knows the immense advantage a factory possesses that can always depend upon a supply of very cold water in the summer season.

If our installations cost more in France, they give better results, and a liberal expenditure on first starting an establishment, often avoids having to incur considerable cost in keeping up repairs, etc., which have to be made in factories meanly and insufficiently constructed: well arranged fittings work better, and the yield is sensibly greater.

Do not, then, neglect this interesting side of the question. Build good factories, and in their construction do not forget to look forward to the moment when you shall begin to manufacture in winter. A factory that is built to keep out the cold of winter will equally keep out the heat of summer. (1)

And do not neglect your choice of implements; spare as much as possible the manual labor of your makers; for the less a man is wearied by bodily exertion, the more is he able to devote his mind to improve itself by observation. Select your apparatus carefully, and in making butter, particularly avoid using that horrid kneading-press (*presse à malaxer*) that is generally employed, and which gives such inferior results compared with those obtained in Europe with the ingenious rotary workers. And build good icehouses, under the direction of competent persons, whom you find disposed to assist you with the fruits of their experience and studies. Let your creameries, too, be fitted up with cold chambers in which to work the butter in summer, and with refrigerators to keep it at a proper temperature during its preparation.

Lastly, secure a good store-house or cellar, in which to keep the butter in good order until the time when the market price shall induce you to sell it.

I mentioned, an instant ago, the sacrifices made in Europe to ensure good dairymen. I have remarked with regret that many whom you employ here only possess the most superficial and insufficient acquaintance with the dairy industry. To tell the truth, I have seen some who were ignorant of the most

(1) Wherefore the roofs of our dairies in England are almost invariably *thatched*. A.R.J.F.

elementary things; I have met some who could not even read the thermometrical indications! In my opinion, if a good maker, one who has given proofs of his ability, offers himself for engagement, you should not refuse to pay him a good salary; he is a pearl too seldom met with to be allowed to escape. This state of things will continue as long as the government does not understand that it is for the general interest to make some sacrifices to establish a good dairy school, in which young makers can be formed and instructed in their duties. Only when that is done, will your dairy industry become prosperous, by manufacturing products of irreproachable quality.

Another question that touches the economical side of your general organisation is hindering the movement and diminishing its chance of success. It is this: the factory can never reckon, with absolute certitude, on a regular quantity of milk, the patrons having no special contracts with the factory, and only bringing their milk when they feel inclined. In such a state of things, the factory may become from one day to another the sport of a fantasy, a caprice of a cabal often got up for the most childish reasons.

Liberty is doubtless a fine thing; but it must not be abused, for then it becomes converted into confusion, and may, in such a case, cause ruin, or at least want of success, to the best institution. In my opinion, a dairy ought never to be started without contracts having beforehand been made with the farmers, insuring all the milk of their cows (except, of course, what is required for family use), and without securing the yield of a certain fixed number of cows. Unless this rule is adhered to, there is no certainty for the supply of the factory, which, under the conditions that now obtain, may be menaced with suspension in the midst of the season.

In one word, under the conditions you are working in, which are rather different from those we meet with generally in Europe, the farmers and the factory form an association or firm. The latter manufactures at so much a pound for the account of the others. It would then be only just that, as the engagement is that all the milk brought to the factory shall be manufactured, that the factory should be guaranteed against the failure of the supply at the time when it has a right to expect its delivery.

In Europe, no company would be so wanting in foresight as to engage in business under conditions so dependent upon contingencies as these: if there is a contract on the part of the factory to do its possible under conditions that guarantee the interest of the patrons, there is also an engagement on the part of the latter not to desert the factory, but to take all their milk to it during the existence of the contract, which is always made for several years. In Europe, we are in the habit of settling our affairs before we start them into operation, and we find that the system that gives security to both parties works well. We must not, as says the old proverb: "pull the blanket on only one side of the bed;" the chances must be equal on both sides, if they are to be fair. Makers and patrons must work towards the same object, which is that of their common interest, and not, as sometimes happens, with sentiments of mutual distrust.

I now pass on to another set of ideas, not less important than the preceding, since without it, the best products will not yield any financial results. To make good butter and cheese, is that enough? Decidedly not; we must as-

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certain how we can dispose of them. As to butter, you have up to the present time, only made enough for local consumption; only a very few tentative exportations have been made this year, and only to the English market, which generally pays badly, as I know from personal experience.

It is absolutely indispensable that you should establish, as is done in Europe, a commercial organisation to enable you to throw the surplus of your production on the foreign markets. Not that I would recommend you, for this purpose, to precipitate yourselves blindly into the arms of European speculators. I have no personal interest in pointing out to you one road in preference to another, but, as to the tempting offers that may be made to you, I can only advise you to be very cautious in accepting them. Do not surrender yourselves to them, believe me, until you have ascertained with certainty that you will derive some positive benefit from them. In short, work for yourselves, not for others; and do not accept the novel outlets offered you, unless they give you every security against loss, and conceal no disappointments and regrets for the future. But, besides this, proceed with great caution; do not begin your export trade with anything but the very finest butter, for if you begin with inferior goods, you will only earn a bad reputation on the market, to your great injury; in which case, Canadian butter will be at once quoted at low figures, its name alone will be an indelible sign of an inferior product, it will be pitilessly rejected by the consumers, and will be at last only fit for the pastry-cooks, who, I swear to you, won't pay high prices for it.

There is, as I pointed out to your secretary long before I came to Canada, an important outlet for your butters, properly prepared, in the countries of Brazil, Indo-China, the French colonies, etc. I am happy at being the first promoter of this idea, and I have great hopes of seeing it realised before long. I studied this question in France, and I am now in a position to insure the acquirement of important markets, if the established practice is followed, and only goods of irreproachable qualities are sent out. However, you must not imagine that I offer you these markets for any personal gain, or in the interests of the trade of my country. No, I am perfectly disinterested, as many of you know. I confess, almost with shame, that in acting in your interests in this point, I am acting against the interests of France, who, with Denmark, has enjoyed up to the present the monopoly of butter preserved for the colonies.

But you are placed in so favourable a position for exporting butter, situated as you are on the high road to Cochin-China and Japan; you have so many facilities for exporting to the West-Indies and Brazil, that I should fail in my duty were I not to say to you: There, is the true direction your exports must take, and there you will be at least sure of success. And besides, you will endow your country with a new and wealth-creating industry.

Now, on another side, let us look the question boldly in the face; the dairy-industry in Canada is making great strides, and soon, as the whole world is breeding stock for the production of milk, good use must be made of this raw material of your industry. I perceive, then, that however many outlets there may be for Canadian butter and cheese, these two branches of the dairy-industry will not be sufficient: we must have recourse to other dairy-products. Are there not any such? Of course there are: you have, in fact, on one side, the

sorts of cheese that are made in France, and of which, I am well assured, there would be an immense demand, especially in the States.

You have, besides, the manufacture of condensed milk, which is hardly made anywhere except in Europe at present, and you could very easily enter into rivalry with her in this matter.

I have practised in France the manufacture of most of these French cheeses in the principal establishments of that country, and I have even built several factories. (1) With fair and remunerative conditions, I should not hesitate to instruct the people of this country how to make these cheeses.

As to the manufacture of condensed milk, it is specially a question of a perfected apparatus, which is to be had, and which well set up and managed with care, is certain to succeed.

Lastly, another fruitful branch to be exploited, always for exportation, is that of the indefinite preservation of milk in its natural state, for those countries that have none of their own. The method pursued in France for this manufacture is of my own inventing, so I cannot praise it here. I will only say that it has been very successful in Paris, in England (especially in London), in Africa, Cochin-China, Tonquin, and Japan, &c.

I think I have reviewed all the branches of the dairy-industry that you can exploit or improve; the field is vast, but in the future it must be so, to answer the requirements of this great and splendid industry.

Continue, gentlemen, to march boldly along the road of progress; neglect nothing to secure the greatest possible profit from your industry, and you will reap the benefit of it, for it is called upon, I am convinced, to become one of the principal sources of the wealth of your country.

Whatever happens to be my fate; whether I leave your province or remain here, believe me your labour and your efforts will always be attended by my most sincere good wishes. And I shall consider myself most fortunate if my modest knowledge shall have contributed in any measure to your success.

I will conclude this *causerie* by expressing my earnest desire that your exertions may be repaid and encouraged as they deserve.

DISCUSSION.

M. CHAPAIS—I should be glad to hear from M. MacCarthy some detailed information on the manufacture of condensed milk. It is a question which has frequently been discussed at these meetings. But we have not had the advantage of having experts present, and without asking M. MacCarthy to enter too fully into details, I think it would be for the benefit of several persons here present, were he to say something about this industry.

M. MACCARTHY—Concentrated milk, as its name sufficiently denotes, is milk whence has been extracted a notable part of the water it contained. Milk really contains about 85% of water; and by a special way of treating it, we succeed in extracting from it about four-fifths of that water.

(1) *Installer* and *installation* are both anglicised words, but are principally used with reference to the induction of Deans, Rectors, &c., though occasionally in the sense of starting a factory, erecting buildings, &c. The same with *exploiter* and *exploitation*. A. R. J. F.

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The operation is performed by heating the milk; but the heat is not to be raised so high as to impart any bad flavour. This result is secured by means of very perfect apparatus, by the aid of which the evaporation of the water is conducted *in vacuo*. Under these conditions, the boiling point of milk is about 50° of the centigrade scale, equal to 122° Fahrenheit, and the evaporation is thus conducted without any bad flavour supervening.

It is a very rapid process: a certain quantity of cane-sugar is added, as an antiseptic, to increase the degree of preservation. The milk is then in an almost pasty state. It is packed in tin boxes, hermetically sealed, and in this condition sent to the colonies that do not *grow* milk. When it is to be used, it is only necessary to add a quantity of water equal to that previously extracted.

Were I to say it was pleasant milk, I should lie. I have used it a great deal when in the colonies, and I must say I infinitely prefer milk in its natural state. For the treatment of certain diseases in the hospitals, milk in its natural state is preferable. You will say that I am pleading my own cause, since I am the patentee of an invention for preserving milk in its natural condition, but in some colonies, Tonquin for instance, there are diseases which cannot be treated with condensed, while they can be with natural milk, and by this very means marvellous results are obtained.

Before speaking of the condensation of milk, I will tell you a technical secret which is not known in Europe, and which they try to keep quiet; but here, there is no such thing as a secret, so they tell me, and I begin to understand it. Well, in making this condensed milk, all the butter is extracted, they don't leave any! . . . Only, if you ask the European merchants, they will tell you that there is some left.

This manufacture must be profitable; you get as much butter from the milk as in the creamery, and in addition you have a product that sells very high, and is made of your skim-milk.

It is true your installation will be rather more expensive. It requires care, as do all apparatus that are of very elaborate construction; but when once the first outlay is made you will find yourself in the possession of a business that will pay well.

I told you just now, in speaking of condensed milk, that the European makers of it will not easily confess that they take all the cream from the milk. I happened one day to be near a factory, but they would not let me look over it. I said: "Come, is it true that you leave all the cream in the milk?" (I knew very well they didn't). They replied, yes. I answered: "What's the use of this separator, then?" They said it was to make butter with, but this milk was not used. That was not true. There was alongside a lot of pigs—not many, it is true—they gave these animals butter-milk alone, for they had no skim-milk to give them. Now, I knew very well, and they had to confess it, that they took off all the cream, and, in consequence, there were two industries carried on, perfectly distinct, but here united, and from which two profits were extracted.

In adopting the manufacture of condensed milk, I must tell you that you will at the same time endow your country (I am speaking of the Province of

Quebec) with an industry that does not seem to have been developed here: I mean the manufacture of boxes for holding conserves. The Province of Quebec, some day or other, will manufacture a goodly number of conserves of different kinds. Well, if the manufacture of condensed milk, together with the packing of butter in tin boxes, receives a certain impulse, you will have endowed your country with three new manufactures: the manufacture of condensed milk, the packing of butter for the colonies, and the confection of conserve-tins, which latter trade, in certain parts of France, employs a great number of hands. (1)

M. L'ABBÉ MONTMINY—Our government is trying to establish a trade with the West Indies: could we not profit by its good will to send our butter thither? Three years ago, I was in Trinidad, and, Canadian-like, I could not get on without butter: they brought me some, but it was 6 francs a pound. At such a price, I think it would be to our advantage to send our butter to a country where it is so scarce.

M. MACCARTHY—Gentlemen, you are admirably situated here for the making of keeping butter (*beurre de conserve*), and I tell you frankly, that if you choose, you may succeed in taking possession of all the foreign markets. And the reason is very simple.

This is how things are generally managed; I am not speaking of Denmark, I never was there, but of France, where a great deal of butter is made for the colonies, where there are packers of butter who have made large fortunes in no very long time, and I don't see why you should not make yours in the same way. This is how they proceed in France: there are markets to which the farmers from a pretty wide circuit take their butter. At these markets, there are men who prepare the butter; and these, inhabiting generally the same town, the centre of a large district—Nantes, for example—send out their agents who buy up all the butter that they can find.

Three qualities are generally made: extra, medium, and ordinary; and, of course, three prices. These butters have been made at least 8 or 10 days, at any rate, for the greater part. They are taken to the factory. These butters are salted, at home, in different degrees, and besides, they have not been made in identically the same way. They differ, therefore, in quality, colour, and degree of saltiness. When once delivered at the factory, they have to be washed and worked over again; consequently they are thoroughly freed from salt, and passed through a machine, in order to get rid completely of the butter-milk; then, they are re-salted to the degree that is required by the country to which they are meant to be exported. For, I must inform you, the degree of salting required is not the same in every country to which butter is sent.

You must understand, then, that under these conditions, butters which have been pretty badly made, which are re-worked in a factory made for the purpose of preparing them for sale, become almost greasy. They have no longer the good qualities of fresh butter.

Here, on the contrary, what can you do? Within a small radius you can buy from several creameries of great importance sufficient to supply an establishment for the preparation of keeping butter. The butter-maker who every

(1) *Confection* is another anglicised word. By-the-by, *apparatus* is plural as well as singular—4th conjugation. A. R. J. F.

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morning receives the milk of a whole parish, may arrange with the *preparer*, and send him every day's make in a fresh state, just out of the churn. Under such conditions, the butter can be prepared for exportation on the very day it is made; it has then all the good qualities requisite for butter of the first class. It can be packed in tin boxes the day of its preparation, and consequently will obtain on the foreign market a reputation without a rival.

M. CHAPAIS—You tell us, M. MacCarthy, that in France when butter is purchased for the purpose of being taken to the preparation-factory, three qualities are made out of it, extra, medium, and ordinary. Will you, please, tell us what difference you make in the quality of these butters, as regards the ordinary fabrication, without speaking of the salting? Do you consider that very inferior butter can be made in spite of the milk being good? And if you are acquainted with this diversity between the three qualities, will you kindly explain it to us. This may be of use to the country: a great deal of bad butter is made here, and from various causes; by pointing out the causes, you may teach us the cure.

M. MACCARTHY—It is difficult to reply to your question, for in France, at least in different districts, things are not done as they are done here. Thus, in the West, where most of the butter for the colonies is made, they have very few separator-dairies. You may be surprised at it, but it is the case. The making of the butter is entrusted to the first comer; it is not thought to be of much importance. The housewife, or the old men of the family, makes the butter, and provided it is done in a cleanly manner, it is considered to be all right.

Still, there are farmers' wives who attach great importance to making good butter, and it is naturally they who make butter of the best quality. They devote great care to it, use their best cream, and thus obtain excellent results. The second quality is evidently made by less careful people, people who fail through want of intelligence or of industry. As for the third quality: I said, just now, that the butter, in France, was drawn to the preparation-factory from a very wide circuit: there are parts of that country, particularly La Vendée, which produce very bad butter; and if it is bad, it is because they heat the cream. In La Vendée, they have, in fact, the bad habit of making the cream rise by putting the milk pans in the very hearth of the fire-place, under the piece of sheet iron on which they make their wood (*charcoal*?) fire. You may imagine what sort of a flavour it gets there, and this flavour it imparts to the butter, which is, of course, of the third quality.

And this inferiority arises sometimes from the fodder, from the quality of the meadows. There are parts of France which produce butter that is justly considered to be the finest in the world, Isigny for instance; but there are other parts that produce very bad butter.

I think that the longer we live, the more creameries we shall see organised in France, as well as elsewhere, and then we shall succeed in making first-rate butter everywhere.

M. L'ABBÉ MONTMINY—Will you kindly tell us what sort of package you employ in France for the export goods, especially for butter for hot climates.

M. MACCARTHY—For hot climates, there is only one kind of package: tin boxes hermetically sealed. There is another plan: putting the butter into glass-

pots; but in this there is a difficulty; the glass allows the light to pass, and the luminous rays injure, not so much the quality, as the colour of the butter. Consequently, the glass-pots are generally given up. Tin boxes are the ones most generally used.

Had I known that this question would have been brought up here, I could have shown you some boxes I brought from France. They are of tin, round in shape, and close hermetically. Formerly, there was no other way of closing them but by soldering, and the parts of the butter that came in contact with the hot iron of the tinsmith were found to be injured. To-day, the system is perfect. The boxes are closed by machinery, without the use of solder; this is called *sertissage*. (1) In this way, you get positive security for the preservation of the butter, and not only so, but all other conserves may be packed in the same way. These machines do away with the need of employing a solderer, and as the good butter-maker is a pearl of great price in the dairy-industry, so is the good solderer a pearl in the manufacture of conserve-tins. Everything depends upon him; he must make the butter-box absolutely impervious to the air; if there is the slightest crevice through which the air can enter, the butter will become rancid. On the contrary, if the box is well closed the butter will keep. I have eaten butter that had been kept for two years. I don't mean to say it was as good as fresh butter, but it was eatable.

M. L'ABBÉ CHARTIER—I beg to call attention to a fact of which I was a witness, a knowledge of which may be useful to the country. I passed the summer in Manitoba, where I found there was an immense quantity of bad butter made, worse probably than the butter made in this province: this was Mennonite butter. These people are lodged like the inhabitants of Noah's ark: all in a heap; poultry, cattle, horses, all in the same room, and you can fancy what a nice flavour this must impart to the cream. Well, there was in Manitoba one of our compatriots, a specialist in butter-making, M. Barré, by name, who has studied his trade in Europe, and follows his profession in the neighbouring province. He buys this Mennonite butter at from 6 to 7 cents a pound—sometimes still cheaper—re-makes it, puts it on the market, and this butter fetches the same price as good dairy-butter. In the course of the summer, or in the fall, this Mennonite butter, re-made by M. Barré, sells for 15 and 16 cents a pound. There may be specialists present who would like to try their skill on the bad butter of this province, it can be bought cheaply. If so, they would disembarass the market of it, and it would not be impossible but that, treated by them, the same butter might reappear on the market in more tempting shape. I know that there is always in store plenty of bad butter which has hardly any value. If these gentlemen by the exercise of their skill can convert this butter and render it fit for sale as good table-butter, they will assuredly have thereby done a great service to the country.

MONSIGNOR LABELLE—I have the honour to inform you that if you wish to send concentrated milk to Australia, you will find a broker or agent in M. Doublet.

M. MACCARTHY—I have written to M. Doublet, and am waiting for his reply. This condensed milk can be exported to all the colonies. I know others

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than M. Doublet, and more earnest ones. I used a good deal of condensed milk in Africa, and it was there that I first became acquainted with it. Well, even if this be brought from Switzerland, still, I am sure the Canadian milk would have an immense sale there, and would be equal to it in every respect.

M. CHAPAIS—I asked M. MacCarthy questions about butter of inferior quality; I should now like to ask the Belgians present a question: can the fresh butter you ask for be exported?

M. HERREBOUDT—I explained myself on this point very badly yesterday; we only buy butter of the best quality, which we ask you to send us in the fresh state. I added, that if this butter became rancid through our fault, we would keep it, but I did not mean that we would buy your inferior goods. On the contrary, we refuse them. Still, we acknowledge that, as the last speaker said, there are means of employing your bad butters for industrial purposes, or for exportation, after they have undergone the subsequent manipulation that the inferior butter of Europe has to be submitted to. But that does not mean that you ought to make bad butter on purpose.

M. MACCARTHY—If I have properly understood you, I must rise to refute what you say. I do not advise you ever, gentlemen, to make export butter with your worst qualities. On the contrary, I would advise you to make your export butter for the colonies of your very best qualities. That is the only way to compete with your rivals on the colonial markets, and to obtain the first rank.

M. HERREBOUDT—We are of the same mind.

M. MACCARTHY—We cannot have both: either you will send your best quality to the colonial market or keep it here; but as for sending unsalted butter to the markets of Europe, it is a delusion, and you must not fall into it.

M. HERREBOUDT—It is a matter of experience. I agree with M. MacCarthy, that bad butter must not be made either for exportation or for local consumption, only first-rate butter should be made. But I tell you,—I state it as a fact, and I will prove it by an experiment we are going to make,—it is quite possible to export your products of the first class in a fresh state, and place them on the Belgian market.

M. CHAPAIS—Unsalted?

M. HERREBOUDT—Unsalted, if for Belgium. And when once your butter shall have reached that country, the Belgian government that is the proprietor of the system of railroads, has in that quality contracts with the French, German, Austrian, Russian, Italian railroads, and is itself able to transport at once, at great speed, and at low rates, over the whole of Europe, all the products coming from Canada.

M. CHAPAIS—Do you ship them across?

M. HERREBOUDT—This, gentlemen, is a question that is under consideration at present. We have been, heretofore, tributaries to the English lines. The transit between Europe and America used to be made by way of New York or Montreal to Liverpool. Now, when you have reached Liverpool, you are not yet on the continent; you have to travel all through England, and then comes another crossing of the sea.

We hope to establish a line of steamers, swift and direct, between the farthest point of the American continent, which we find to be in the Province of

Quebec, and the nearest point of the continent of Europe, which will put you in communication with all the great European towns, a point which is on the Belgian coast. This port will be a wharf with deep sea alongside of it, 800 mètres from the coast, opposite the mouth of the Thames, and therefore opposite London. Steamers can do it in four days, passing south of Newfoundland and of Ireland from Gaspé to Bruges-Port-de-Mer, and thence in a few hours to London. So that, you will reach London two days sooner than at present.

This line of steamers will be created by Canadians and Belgians, to the exclusion of England. We want neither the fleet, nor the capital of England, but we desire to treat directly: Belgians with Canadians.

M. DELLICOUR—I wish to make a few remarks to M. MacCarthy who observed that Canadian butter should be exported in a salted state. I explain this to myself by the fact that he has not been in Denmark. I, an old Belgian practitioner, affirm that the exportation of perfectly saltless butter to foreign parts can be made safely. The Danes do it; they send their butter off, and it arrives at its destination 6 weeks after leaving the ports of Denmark and of Sweden. Why cannot the same thing be done here?

France, I know by experience—I have lived there long enough to know—has not succeeded in producing that *dry* butter that will bear the voyage. French butter is rather *fat*, and requires antiseptic salt.

Even now, fresh butter is exported to the West-Indies from Denmark; and I believe that Canada is in a position, as regards climate, soil, and dairy-cattle, to be particularly successful in producing that butter so much sought after, with such a fine aroma, similar to the Danish, which rivals the Isigny butter on the Paris market. You see this Danish butter crossing your country on its road to China and Japan; and nevertheless it is *fresh* butter, thoroughly fresh, which crosses thus, and sells much higher than salt-butter.

It is on this line, Canadians of the Province of Quebec, that you must emphatically seek your future; and I hope that by the addresses we intend to deliver here we shall succeed in bringing this work of ours to fruition. It is enough to instruct the people: success will follow afterwards.

M. TACHÉ—What do you and M. Herreboudt mean by *fresh* butter? Is it butter entirely without salt, or slightly salted? (1)

M. DELLICOUR—Fresh butter is, so to speak, utterly saltless. When we extract the butter-milk, the butter being in the granular state, we use a very weak brine. The salt has hardly an even momentary action on the butter, since we at once wash it with pure water; and here I agree with Mr. Lynch, to whom however I refer my hearers on the subject of churning.

M. TACHÉ—Do you, M. MacCarthy, mean by *fresh* butter, butter utterly saltless?

M. MACCARTHY—Decidedly; besides, M. Herreboudt said just now, that the Belgians wanted butter entirely without salt: I knew this long ago; but I also know that you never will succeed in exporting your Canadian butter unless salted; you won't get paid for it, because it will reach the market in bad condition.

(1) Absolutely unsalted butter I never met with in England, and only once in Scotland. All *fresh* butter in the best houses in the former country has a slight addition of salt—say, $\frac{1}{4}$ oz. to the pound. A. R. J. F.

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M. HERREBOUDT—I hear people say: "In salting our butter, we sell our salt with the butter." All those who bring butter to market in Belgium declare it is unsalted; but they try, surreptitiously, to add the greatest possible quantity of salt. The buyer has to judge by the taste if it is, or is not salted; but, according to the seller it is always saltless: this is a little commercial trick.

MONSIGNOR LABELLE—I tried to get salt butter when I was in Europe, and could never find any. During a stay of 9 months in France and Belgium, I had to eat fresh butter. Besides, how could they add salt without the buyers finding it out?

M. HERREBOUDT—Your remark is an absolute confirmation of what I just said: all the butters that we sell in Belgium are not of our own production, but we buy them from all parts of the world, and export them immediately; and the only condition we exact is, that they be delivered free from salt.

M. CHAPAIS—I am under the impression that after salting, butter weighs less than before.

M. HERREBOUDT—Possibly so; but, personally, I know nothing about butter and cheese. I am only a middleman, come hither for the purpose of informing you of the existence in Belgium of a firm ready to form commercial relations with Canada, and to ask you to send it samples of your products.

M. COTÉ—Will you be good enough to explain to us how it is that butter after salting weighs less than before?

M. MACCARTHY—The explanation, I think, is simple enough. When butter is not salted it contains a certain amount of butter-milk, which the salt completely expels at the moment of its incorporation.

M. HERREBOUDT—After a little time; but ours is salted at the moment it is about to be sent to market.

THE ORGANISATION OF AGRICULTURAL INSTRUCTION IN BELGIUM.

LECTURE BY M. A. DELLICOUR (1).

Gentlemen:—

It is not sufficient to recall to your remembrance these general *data* on the manufacture of butter; you are acquainted with them already, and have practised them for many a day. Your efforts are specially exerted to insure their penetration into the daily practice of your people as soon as possible. And it is in the hopes of contributing to this work, so eminently useful, that I also propose to indulge myself in giving a concise account of some of the measures taken in Belgium to improve the cultivation of the country, and to increase its riches.

(1) N.B.—This lecture is the second part of an essay written by M. Dellicour for our convention. The former part, which was not read, will be found at the end of this report.

Associations—For a long time it has been recognised that the advice, even the example of intelligent farmers, could not succeed in securing promptly enough the diffusion of improvement realised in practice.

The desire for improvement was not guided by a well contrived uniformity. The need of a general association made itself felt, and, before long, each of our nine provinces had its agricultural society, which, united to a central body, supported the requests of agriculture to the government.

The Central Agricultural Association, as it is called, concerns itself with the more important matters, while the provincial clubs study the same problems from a more confined point of view.

These latter societies are composed of the presidents and delegates of the local clubs which comprise within the sphere of their action several parishes. It is to the last of these that chiefly falls the duty of treating the special subjects relating to the different branches of regional cultivation.

All these societies of farmers, properly so called, and of persons who interest themselves in the pursuit of agriculture, so ancient and yet so novel, enjoy favours from the government, as well as numerous subsidies granted by the provinces and by the *communes*.

It is owing to these committees, so powerful by the influence of their members, that we possess so many agricultural papers; it is owing to them that we have our competitions, our meetings, and, generally speaking, all the measures that have raised our country to the first rank in agriculture are due to them.

Progress does not stand still; our societies understand that; they have not fallen asleep over their early laurels, and they continue to seek by every means to extend agricultural instruction. When they are unable by their own unaided strength to succeed, they betake themselves to higher quarters, and, by persevering, succeed in loosening the strings of the common purse, and with state-assistance, obtain the desired solution of their difficulties.

To these proceedings, gentlemen, we have been peculiarly indebted latterly for the creation of 1. the body of "State-agronomes;" 2. of dairy and other schools; 3. of practical and theoretical lectures.

Agronomes—The *agronomes de l'Etat*, as they are called, are functionaries almost invariably selected from engineers who have passed through our agricultural universities. To their scientific acquirements must be joined thorough practical skill.

Appointed to the number of two or three, according to the importance of the region assigned to them, their duty is to aid farmers with their advice, either in private conversation, or by letter; to direct the experiment fields established everywhere, to define the value of fertilisers, their efficiency, their suitability to different soils; to superintend the choice of seed, and the introduction of new species; to watch the improvement and development of the different breeds of stock; to facilitate the introduction of select breeding stock; to promote the application of novel methods recognised as the best; in a word, to do all and everything that concerns the advancement of agriculture within the circle of their operations. (1)

(1) As there is not the thing or office in England, so there is not the word to express it. Sir John Bennett Lawes, Bart., is the only *agronome* in that country. A. R. J. F.

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The agronome must deliver numerous lectures on the different systems accepted as the most necessary in, and the best adapted to, his district. Among his functions also enter the superintendence of fertilisers sold, in which he is aided by numerous agricultural laboratories; and the repression of fraud, as well as the punishment of the guilty.

These numerous and useful officers, who are under the direct control of the Department of Agriculture, meet frequently together, to communicate their ideas, relate their labours, the result of their researches; to consult on the means to be put into operation for the worthy fulfilment of their charge, to maintain themselves at a level with the knowledge and progress realised elsewhere; in a word to place themselves in a position to be of the greatest possible use to the farmers of their district.

Although it has only been in existence five or six years, this body of active diffusers of progress has been of the greatest use to our farmers, both small and great, in enabling them to pass through the agricultural crisis of these later times.

And I do not hesitate to say, that similar institutions would have everywhere rapid and successful issues; but an enterprise of this kind can only be asked for and countenanced by the agricultural societies: the state must found it.

Schools—Alongside of the two principal establishments for higher education, exist, under the protecting wing of the state, a station for experimental researches, as well as many laboratories.

In different districts, local schools, more or less special in their object, have been established, and in every primary school an elementary course of agriculture is given.

Belgium, where almost every kind of crop is grown, includes three grass-districts, properly so called, one of which is particularly noted for its butter and cheese. I was born in this latter district, and it is on account of what is being done there for the improvement of the dairy-industry, that I am delivering this address.

The dairy-school of the Downs of Herve, established only last year by government, with the aid of the local clubs, is not only temporary, but travels from parish to parish.

The staff comprises:

1. A dairy-professor, who has the direction of the general studies and work. This year, these functions were naturally entrusted to a Belgian, a specialist in this subject, M. Chevure, professor at the Royal Agricultural Institute at Gembloux, and one of its oldest members. He was, besides, the original promoter of these schools.

2. A veterinary surgeon, lecturing on the elements of physiology.

3. A professor of pastoral cultivation.

4. Two dairy-instructors (*women*) for teaching and practice. The first were young women, sent by the government, to France and Denmark, where they took their diplomas of capability in the celebrated establishments of the two countries.

The instruction is given in such a way that science always marches side by side with practice.

The courses, which are entirely free, last for three months, and comprise theoretical lessons, tuition, and practical work.

During the practical application of the lessons, only the most perfect apparatus is used; novelties which may be presented are tried, and a just estimation of their value is made. The last improvements in the methods of making butter and cheese are put into practice; cheeses are made of those kinds which are not produced in the district, but which are thought to be the most advantageous, as much as regards their selling value as the economical employment of full or of skim-milk.

The studies close with an examination, both theoretical and practical, and the girls who receive their diplomas may then disperse themselves over the country, and carry with them everywhere the good seed of improvement.

During the course, the school is open to any farmer introduced by a superintending member of the agricultural committees; they can inspect its working, judge of what is done and learnt there, and even be present at the practical lessons.

By thus throwing open the schools to all those interested in them, it often happens that even those who have only taken advantage of this privilege with the view of satisfying their curiosity, if not with preconceived prejudices, become their most earnest supporters and their warmest defenders.

Lectures—These schools are not within the reach of all, therefore means have been sought for to remedy this defect; our societies wishing to cause instruction to find its way into the most remote corners. To attain this end, courses of addresses on cultivation have been established in the form of weekly lectures.

Intermittent (*détachées*) lectures are also delivered by specialists at different places named by the department of agriculture in accordance with the reports of its agronomes and the requests of the local clubs. In these numerous assemblies, after developing his subject, the speaker takes part in a familiar discussion, devotes particular pains in his reply to any objections that may be offered, discusses the ideas brought forward, and does his best to cause his hearers to thoroughly discern those points and details which they had not sufficiently understood.

Here, gentlemen, are springs from which everybody can freely draw the water of knowledge. But, unfortunately, it happens that even they who have most need, find pretexts for neglect, and do not evince all the ardour for instruction that might be expected. Still, by their number and frequency of meeting in the same place, these assemblies always have some effect. Those who attend them, reflect afterward on what they have heard, they chat about them, at the *café* in the *veillée*, (1) in the bosom of their families, at meals, and even the simple farm-labourers profit by the lecture delivered on the previous Sunday.

If the good advice is not immediately applied, its effects are observed in the neighbour's farm, he being more enterprising and less a slave to routine; certain jealousies and rivalries become established; trials are made by the incredulous one, very often without his appearing to be doing so, and without

(1) For *café*, read *tavern*; and for *veillée*, *evening*. A. R. J. F.

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having much confidence in their results; the operations of husbandry are more carefully conducted, the cattle better fed and better treated. What happens?

Before long, improvement has penetrated as far as the spot where old routine had been used to reign as absolute mistress for time out of mind.

Local Agricultural Clubs—I know by your former reports and by the lecture of M. Dalaire, that it is not in the presence of such an audience that I ought to try to prove the happy influence of local clubs and of the lectures they cause to be given. But I cannot insist too strongly on their usefulness, because they are of greater importance here than in our older countries.

You have not those meetings at the *café* on Sundays after service, where one hears both young and old talking of farming, stating their opinions, relating what they have done, seen, or read, during the week; discussing the operations of the season, describing the results of their personal experiments or of those obtained in the experiment-fields of the parish: chatting about the prices of goods, the yield of crops, the markets, in one word of all things that are interesting to the local agriculturist.

It is not, gentlemen, from a desire to ask for the opening of new bar-rooms, or that they should be opened on Sundays, that I speak, but allow me to tell you that nearly allied to evil may often be found some little good.

Practical Lectures—Lectures, in spite of the good they produce, do not yet yield all the fruit we have a right to expect from them. They have often the defect of being too theoretical, and are not sufficiently attractive to common minds. So it has been attempted to attract to them larger numbers, by endeavouring to put something palpable before the very eyes of the audience. Milk is tested, the difference in quality of various samples is compared, mechanical skimming is done by means of a separator worked by hand-power, cream is churned, and experiments tried with the most approved butter-presses.

It is to the agricultural syndicate of Verviers that the honour is due of being the first to institute these practical lectures of such indisputable utility.

Agricultural Syndicates—These syndicates, founded outside the local clubs, were established, like many others, however, to extend the trade in butter, to restore it, to put a stop to the frauds so common since the invention of *margarine*, and especially to perfect the making of butter in order to be able to contend with advantage with foreign competition.

These at first pursued their object by publishing periodically the names of their adherents in order to introduce to the buyers, especially to strangers, those who make pure butter of the best quality. The pats sold by its members must bear the stamp of the association and the mark of the seller. This measure aimed at permitting the purchaser to apply to an expert-taster or to a chemist, and that at the expense of the association, to obtain assurance of the quality and purity of the butter purchased. Heavy penalties, besides those inflicted by law, punished those who contravened these social statutes.

But this intervention, although a beneficent one, did not sufficiently hinder the diminution in the sales, and the lowness of the prices. In a word, the reputation of Herve was diminishing more and more abroad, a situation very near a kin to that of Canada.

The syndicate, which recoils before no obstacle to the attainment of its object, has placed itself in accord with the agricultural societies of the district, and has instituted the system of practical lectures called *volantes*, travelling.

Practical Travelling Lectures—This is how its delegates work at present. Each lecture is divided into three distinct lessons which are given on the farms.

The first, on a Sunday, perhaps, comprises the testing of milk, general instruction, and separator-skimming.

The second, on the following Wednesday, on churning and the working of the butter.

The third, on the Sunday following the first lesson, on the examination of the advantages resulting from the employment of modern appliances compared with the old methods.

A woman assistant, one of the best ex-pupils of the dairy-school, acts as aide to the lecturer in the manual labour.

It seems to me that with such means within the reach of every one and of every one's purse, since the lectures are perfectly free, all that is needed is that a little earnestness should be displayed on the part of those interested.

The weather, the time occupied, the difficulty of change of place, distance, a party of pleasure, and other motives, if others there be, all must infallibly fall before such persistence on the part of these devoted promoters of progress. There is no doubt that success must recompense the expenditure of so much pains and perseverance.

I do not know, gentlemen, if you will find in this description any information useful and applicable to this country.

Although you have only very lately entered on the lofty march of progress, you have already done much for the advancement of your national agriculture. You have founded clubs that are producing immense good. You are multiplying lectures, you are sending out to all places inspectors and special agents charged with the duty of instructing the farmers and of aiding them with their advice. The sentiment of union is innate in you, and it has produced numerous and prosperous co-operative associations. Experiment-farms are setting a good example; with their help the improvement of practical agriculture is not doubtful. You are searching for new markets for your products. In a word, you have in a very short time covered the first stages of the long and involved road of progress.

But these first successes must not suffice; you must continue to march in front. You have the moral and financial support of the public means. Never cease then from demanding the establishment of a central and superior school of agriculture, conducted by competent, but above all, by practical men. Press for the creation of this nursery in which shall be formed the future leaders of your agricultural industries. Multiply your model-farms. Found new clubs, open numerous schools. Teach your masters to instil into their pupils, with the first elements of agriculture, a love for labour and for a free life in the fields. Select lecturers able to support their knowledge of the theory of farming by a practical acquaintance with every day work. Form syndicates for the sale of your products, and for the purchase of any nutritive or fertilising

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materials you may require in your business. Never cease uniting your efforts to produce better crops and more of them. Profit by the results obtained at your experiment-farms. Be yourselves an example to your neighbours, and, lastly, let no opportunity escape of promoting the improvement of your agriculture and of thereby increasing the prosperity of your fellow citizens.

In conclusion, gentlemen, I thank you for the kind attention you have paid to my address, and I pray you to excuse me for having trespassed so long on your precious time.

REMARKS BY M. COLLARD.

Mr. President and Gentlemen :—

Allow me to add a few words to what has just been said by my colleague and countryman, Monsieur Dellicour. I knew that he had left our country some months ago; I arrived here only a week ago, and I bring fresh news from home. He spoke to you about agricultural societies, but since he left, all those societies have been re-modelled.

Thus, the government seeing that the farmers did not come often enough to the sessions held by these societies, felt that they must be altered. And they were altered. Everywhere, in all the villages where 40 members could be got together, it has established agricultural assemblies. These devote themselves to the study of the interests of the parishes and *communes*. The assemblies, in their turn, send to a provincial assembly, under the honorary presidency of the governor of the province, three delegates, who thus form a provincial assembly, entrusted with the interests of the province, and with the duty of pleading in favour of the interests of the farmers in the provincial council.

These provincial councils, in their turn, send delegates to a higher council of agriculture in the capital. This is presided over by the king, who has to study all the agricultural questions connected with the country, and to communicate his ideas upon them to the minister of agriculture, who always presides at their meetings.

This is what is being done for the dissemination of agricultural instruction in every part of our country. In fact, in every meeting of the *comitia* there are always one or two addresses on those subjects that are most nearly related to the questions of the day. And, I assure you, these addresses do a great deal of good.

M. Dellicour spoke about the different schools existing in Belgium for the dissemination of agricultural information. He passed lightly over the superior schools established at Gembloux and Louvain. It is at these two schools, that engineers, commissioned to diffuse agricultural knowledge throughout the country, are trained.

It must not be supposed that only theory is taught in these schools. By no means: theory is fortified by practice. At our schools are experiment-fields; and we have our farms. We visit the neighbouring farms; we have our laboratories. We learn as much practice as theory.

Now, besides the superior agricultural schools, we have, all through the country, schools for adults. In these the courses are given throughout the whole winter; they are intended for any farmers who desire instruction. The courses are given by agricultural engineers, generally on Sundays, either after high-mass, or after vespers. In these courses, all branches of farming are taught; dairy-work, the manufacture of butter and cheese, &c.

I have, accidentally, brought with me a programme of these courses. The following are the subjects treated in them:

SUMMARY OF THE PROGRAMME OF THE COURSE TO BE GIVEN AT THE SCHOOLS FOR ADULTS.

The lecturer is to talk to his audience at first about those things that are familiar to its members, for instance: the crops, and the methods of cultivation pursued in the district, rotations, the nature of the soil, its advantages and disadvantages; the local agricultural industries, the fairs, and markets, the yield of crops in the *commune* and its neighbourhood, compared with those abroad; lastly, the agricultural crisis occasioned by the discoveries of science, and the remedies that this same science affords to dispel the crisis she herself has brought about.

It is not until the attention and confidence of the audience have been thus captivated, that the professor is to attack the series of questions that will lead him insensibly to the exposition of the elements of agricultural science.

He will put these questions successively: Of what are plants composed? How are they nourished? What is the elementary (*ultimate*?) composition of their ashes? What part do air and water play in the nourishing of vegetation? What is the composition of dung and urine? What are their advantages and disadvantages? How are they to be completed by the addition of chemical fertilisers? How can plants show the farmer what kinds of fertilising elements are wanting in the soil, etc.?

The principal points on which it is important to dwell may be reduced to the following:

1. *The doctrine of restitution*, of which demonstration by inspection may be furnished by crops grown in sand, or in the experiment-fields (analysis of soils by plants, dominant constituents (*v. Ville*), complete and incomplete manures.)

2. *The selection of plants*, by choice of seed, new methods of sowing, and the preparation of the land (sowing-machines, experimental demonstrations.)

3. *Superintendence sales of manures and seeds*. Functions of agricultural laboratories; contracts with dealers in fertilisers and seeds; way of taking samples from bulk;

4. *Rational methods of working the land*, and the modern rotations founded on these methods (advantages of the new ploughs, harrows, horse-hoes, double mouldboard ploughs, &c., and of harvesters, hay-tedders, trench, and subsoil-ploughing, drainage);

5. *Rational feeding of stock*, elementary principles of breeding and of the selection of animals; hygiene of the stables and cowhouses;

6. *Rational treatment of milk, butter and cheese*;

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7. *Elementary instruction in rural economy and farm accounts* (need of association; syndicates; farming on shares; co-ordination of the relative interests of proprietors and farmers (*tenants*); dangers of too large farms with insufficient capital and manure; capital required for small farms, etc.) (1).

8. *Agronomes de l'Etat*. Object of their institution; services they are intended to render to farmers; creation of experiment-fields, oral and written consultations, etc.

A lecture is to be devoted to each of the most important of the special crops of the district, regarded from the three points of view of the treatment of the soil, the manures required, and the selection of plants. It would be well to insist upon crops to be introduced or abandoned in accordance with the advice of the agronome of the region, who has the control of this instruction, and should hold himself at the disposition of the teachers to furnish them with all desirable information, to enable them to reply, with thorough confidence, to the questions put to them.

You see by this account that the farmers of our country are in a position to draw knowledge from a clear spring. The teachers are selected with scrupulous care, and they can with similar care disseminate agricultural information throughout our parishes.

Yesterday, M. l'Abbé Choquette spoke on the subject of chemical manures, and let fall a word or two on experiment-fields. At home, too, we have them. They are under the control of the state agronomes, and of the teachers who conduct the schools for adults. I myself have managed a few of these experiment-fields. The thing is in itself simple enough, it is done thus:

There are a few experiment-fields established all over the country; in the same region, in the same parish, there is an experiment-field for wheat, for oats, for potatoes, for meadows; and we try to select it in accordance with the instructions given by the agronomes of the state or of the district, on a piece of average soil. Those pieces are selected in this way: you have a meadow, for instance; you mark off part of it, a plot of some square feet. This is again subdivided into 8 or 10 equal parts; all are cultivated in exactly the same way, all receive the same attention, and on each division is sown a certain fertiliser.

You know, for M. Choquette told you, yesterday—there are three elements that must specially be returned to the soil where it is exhausted. I think you are on the eve of making this restitution. Our little country has been for a long time making it, seeing that it had worn out the whole powers of the soil by constant cropping. Therefore, I think it would be as well to say a few words on the subject.

As I just said, there are three elements to be restored to the soil: nitrogen, phosphoric acid, and potash. On the first plot, put a complete manure, *i. e.* a manure composed of nitrogen, phosphoric acid, and potash; on the 2nd plot, a complete manure, barring nitrogen; on the 3rd, a complete manure, barring phosphoric acid; on the 4th, leave out the potash; on the 5th, give nitrogen alone; on the 6th, potash alone; on the 7th, phosphoric acid alone; on the 8th,

(1) *Culture extensive* farming on a large scale as in England, etc., *culture intensive* farming on a small scale, but making use of every square foot of ground to the best advantage, as in Guernsey, Jersey, etc. A. R. J. F.

in Belgium we put lime, as that element is wanting in our soil; on the 9th, farm-yard dung; on the 10th, nothing: it serves as a comparison.

Every farmer, as he passes along the field, can judge of the effect produced by the different manures. If, for instance, the complete manure gives the best results at the end of the season, he says to himself: the land is poor, it wants the three elements necessary to the growth of plants; we must then restore to it nitrogen, phosphoric acid, and potash. If, on the contrary, the best crop appears to be on the plot where the phosphoric acid went—which frequently happens: well, nitrogen and potash are not required; the restitution of phosphoric acid is sufficient. By means of these experiment-fields, you will economise greatly, for, if you listen to the agents who sell chemical manures, they will often try to sell you *complete* fertilisers, because they pay them better.

It is very easy to try these experiments on your farms, by choosing a piece of its average soil, which you should divide into several plots, and on each of these plots you must sow a little fertiliser according to the advice which the chemists or any other competent persons will give you. That, gentleman, is what I had to say.

THE PRESIDENT—M. Chapais would like to know from M. Herreboudt what is the composition of the recipe he mentioned to take away the rancid taste in butter.

M. HERREBOUDT—I do not think it is a scientific recipe. It is one in common use among the people. It is simply to put carrots into the butter; the carrots will in great measure attract to themselves the rancid taste acquired by the butter. It is an old woman's recipe. Some people use water in which carrots have been steeped, to wash the butter with. Pray observe that we do not ask for rancid butter for the sake of experimenting in this way with it; but when rancidity attacks any butter, it is as well to have this little familiar means of expelling it.

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THE DAIRY INDUSTRY.

A LECTURE BY M. CHAPAIS.

I am here in the quality of a friend to most of you, for I meet year after year all the gallant champions who are fighting in favour of the dairy-industry, and who meet together yearly, in various parts of the province, to discuss questions relating to this splendid business. I may say that I am one of the ancients of this association, and that I have done my best to promote its interests. In past years, I have only acted as member and director of the association; but to-day, I present myself before you under two other titles: first as assistant-commissioner of the dairy-industry of Canada, (I will explain afterward how it happens that I occupy this position), and secondly, as the secretary of the Federal Association of the dairy-industry of Canada. This will show you that I am, body and soul, in the dairy.

Last year, or rather, two years ago, one of the most distinguished members of our association, of the English tongue, Mr. W. Lynch, after a long voyage made to England for the purpose of studying the questions relating to dairy-work, brought home with him an idea which he spread abroad in every possible way, and from which he obtained splendid results. Addressing himself to all the provinces of the Dominion, he called a meeting at Ottawa, which resulted in the foundation of a Dominion Dairymen's Association, to which belong the chief agronomes and manufacturers engaged in the dairy-industry throughout the country.

The first fruits of this combination was the formation of a department of dairy-industry for the Dominion, and the second, the appointment of an English speaking commissioner, Professor James W. Robertson, who regrets very much that he cannot meet you here to-day, but who is working with all his power to promote the industry that is the object of our present meeting. As Mr. Robertson is an Englishman, and is not intimately acquainted with the wants of the French population of the Dominion, it was thought best to ask for the appointment of some one who would do for the French what Mr. Robertson is doing for the English; and they did me the honour to appoint me to this post; an honour I appreciate at its true value, but which is at the same time, a heavy burden for me.

When I was at Ottawa, at the time of the convention I just mentioned, I considered it as a compliment to my French speaking countrymen that I was chosen as secretary to the Federal Association. In that position again, I felt my incapacity, and in accepting it, I yielded to the pressure that was exercised on me. This position I filled to the best of my ability, and if I sometimes fell short, it was not owing to any want of good intentions.

After this rather lengthy preamble in description of my position, I am about to tell you what observations I have made during the fulfilment of my new functions. It is not long that I have been discharging them. This year, I have limited myself to the survey of the Province of New-Brunswick and of certain of the townships of the Province of Quebec.

Our dairy-industry is attached to the earth fundamentally: to have milk, we must have good cows; if we have cows, we must feed them; to feed them, we must cultivate the soil. Consequently, we cannot talk about the dairy-industry without mentioning agriculture. We must take care that our farming is well managed, for, without good farming, there cannot be a profitable dairy-industry.

I regret to say—I am only speaking of certain places where I found bad farming; they are, unfortunately, too numerous in our province and elsewhere—I regret to say, that I soon found the chief cause of failure in agriculture to be the exhaustion of our farm-lands, and this failure is our own fault. By an unintelligent system of cultivation, we have worn out our farms, and now, the problem is to persuade the farms, that are almost incapable of yielding anything, to produce something.

We have dealt with the land, as some farmers deal with their men. In the morning, the man has a good breakfast, he is full of vigour, and he works well. Towards 11 a.m., he begins to look up to the sky, not to invoke him who dwells there, but to see if it will soon be noon. When that time comes, he goes to the farmer's house; he has a good meal, and he sets to work again with renewed ardour. Suppose that this man whom you employ had had no dinner, and that you were to say to him: "My friend, there is not much to eat at the house, we are a long way from home, we might as well stay here, and have our meal at night." What would the consequence be? The man would do less work, and, in the end, you would get no good out of him.

The earth is, for our purpose, a servant, and an excellent servant, too, who does us all the service imaginable, as long as we pay her her due. Well, gentlemen, trying to get work out of the earth without giving her food to eat, is as utterly futile, as trying to get work out of a labourer without feeding him. The question of restitution has been treated by able agricultural economists; it stands in the first ranks *quo ad* agriculture. When we carry off the products of the soil from the farm, we are robbing it of its riches, and if we cease to feed it, it will yield no more.

Being ignorant of these principles in our province, we have worn out the forces of our servant, we have brought her to bay: and if we are now passing through an agricultural crisis, it is because our servant has been half, if not wholly, starved.

The first problem, then, requiring solution from those who are engaged in the dairy-industry is, to restore to the land, as economically as possible, the forces it is in need of. We have remarked, during the years we have been pondering the question, that dairying is decidedly the sort of farming most calculated to obtain for the land the restoration of its powers. It is dairying that allows of the securing of the greatest possible quantity of produce from the land, and of restoring the most thereto.

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Other industries used to appear, at first sight, to be able to offer us this resource, and formerly they did so up to a certain point. But, now, the conditions are changed, and the production of grain, and the feeding of butchers' stock, are at an end, as far as we are concerned. Owing to the construction of railways, the West offers us an immense territory where beef and mutton can be and are produced for next to nothing. It enters into competition with us with its cheap grain, and its cattle that cost hardly anything, while our cattle cost us seven months of wintering. We can, then, no longer successfully devote ourselves to the cultivation of grain and the rearing of cattle for the butcher. We must hunt after something more nearly allied to the means and circumstances in which we are placed. We must devote ourselves to dairying. With the dairy-industry at work, we begin by growing green crops. After ploughing in these green crops, we raise a certain quantity of grain and hay. The cattle, at first few in number, with improved food from this first improvement yield us more manure and more products than before, and enable us to improve our farming and increase our stock.

I do not wish to indulge here in a "*petitio principii*" (*begging the question*). I conceive that there will always occur a certain amount of loss; first, the animals' growth will always take from the land something that it cannot restore to it, and the same with milk, butter, and cheese. Still by far, the greater part of the food which enters the animal is ejected in its dung. Only 20% of loss has to be compensated, and by the profit we make in dairying from the milk, butter, and cheese, we are enabled to purchase those elements which must be restored to the land, to make it renew its powers of production.

Let us persuade those of our farmers that have exhausted their land to embark in dairying; this is the way to restore their farms to their pristine fertility. I have spoken of the cattle that are necessary to the production of manure; I might also speak of chemical fertilisers; but, observe that I am talking about those impoverished farmers whose land is ruined, and who have no funds for the purchase of artificial manure; and I want to show them, in a practical manner, how to improve their land by degrees, knowing that they have not the means to make improvements on a large scale.

Most farmers fail in not having enough cattle. Thus, among the Acadians of New Brunswick, I found certain people, not very well off in respect to manure, and living with difficulty upon their farms. One of them was farming 120 *arpents* (about 100 acres); he had 3 cows and 3 horses, and this man said that his farm did not pay. I was ready enough to believe him. In that province, oats were a failure; he had very little hay; his three emaciated cows were licking away at a miserable pasture. Observe the condition of his farm. This man had not cattle enough; and without cattle it was impossible for him to restore the fertility of his land.

Begin by forcing the land to yield more than formerly. With this surplus, you will be able to keep more stock, and their numbers will yearly increase. And when I use the word "stock," I, of course, mean, as I am talking of dairying, milch cows. For it is almost impossible, as I showed above, for us Eastern Canadians to compete with the farmers of the West in growing grain and in bringing on the market butchers' beasts.

Another fault among farmers, in districts where cultivation is not so bad as that I have just mentioned, is the want of care in preserving what they have already got. Thus, in by far the greater number of the places I visited, I remarked an inexpressible want of care in the management of the manure. The dung is thrown out under the eaves of the cow-house, and gets well washed with the drippings: unfortunately this is the rule, not the exception, and this from one end of the year to the other.

You know how lye used to be made: water was allowed to filtrate through ashes, and that made good lye. But, if the lye was once made, and more water was sent through the ashes? Nothing would come from them, because they had already been exhausted of their potash. If, instead of ashes, we lixiviate dung, the water filtrating through it is dark in colour and charged with the principles of the manure. For a farmer who was incredulous on this point, I had 25 cabbages planted on one bed, and 25 on another. On one, I put the liquid of a tub-full of dung, on the other the lixiviated dung itself. In the fall, the bed that had received the liquid produced splendid hearts of 8 lbs. each; the other, that had received the washed dung, gave only three hearts, that weighed from 2 lbs. to 3 lbs. each, and the other cabbages never hearted at all: a proof that the lixiviated dung had lost all its strength.

In winter, the farmer generally, throws his manure every morning out of doors; thus making a compost of snow and dung; and in spring, he has an immense heap of this mixture. The snow, melting, washes the dung, and forms those pools of coloured liquid that carry off the riches of the farmer into the nearest stream.

It is easy enough to remedy this state of things. You have only to dig out a certain space of ground in the form of a basin, say, 8 or 10 inches deep, and cover the bottom with well beaten clay; over this put a cheap shed, and you have a perfect dung-pit. The manure will retain all its goodness, and you have at once an economical means of making your land yield much more than it would do otherwise.

In many places, farmers have learnt to keep a greater number of cows, but what sort of cows do they keep? I go into a cow-house, and I ask the farmer how much his cows are worth? There is a fine one, and that other one is passable, but there is a third that is very poor. The farmer replies: This one gives 2 gallons; the other 1 gallon. And yet they all eat the same food, out of the same manger. Nobody can afford to keep a cow that gives only 1 gallon of milk from the same food that its neighbor that gives 2 gallons eats. I ask: Why do you keep them. The reply is: I am not going to sell them and buy good ones, for which I should have to pay absurd prices. And I do not advise him to do so, but farmers might rear heifers from good cows. In this way they might have one chance in two of getting a good animal. I say one chance in two, for in the province they don't trouble themselves much about choosing the bull. If a bull bred out of a good milker is put to a good milker, the heifer from this union is almost sure to turn out to be a good milker too.

Our Canadian cows used to be thought no longer worth anything. People used to say they were worn out, they were no longer profitable; and it was true for they got next to nothing to eat. In summer they were turned

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out to graze where there was no grass, and in winter, they were so badly fed that, when spring came, they often had to be lifted up by the tail. And then people said they gave no milk! Of course they didn't, and they were quite right! If they had given any it must have come from their own proper tissues.

But nowadays, up to a certain point, these things are altered: the Canadian cow, better fed, gives astonishing results. Some of you have visited our districts and have picked up good Canadian cows that give better yields than Ayrshires and crosses. We have Canadian cows that give from 40 lbs. to 45 lbs. of milk. From this point of view, as well as from many others, we may well shout: Vive la Canadienne!

One thing caused me great pain in my travels: I saw many people in search of the solution of a problem that, in my opinion, is insoluble. Do you think I am speaking of those who are hunting after the "perpetual motion?" By no means. There are, it is true, searchers after that *mirage*; but I found many farmers who were trying to solve a thing quite as absurd as that. And the misfortune is, that, in their search, they are not only losing their time, as the searchers after perpetual motion do, but they are also entangling their conscience. This problem is: they are trying to make butter and cheese out of water! You have no idea of the number of people who are at this work! Some from interested motives: these are the patrons who seek to get more than their own rights; and there are some who are obliged to do it: these are the men who are making butter and cheese with the watered milk sent into the factory. This is the greatest misfortune we have to lament of all that touch the interests of the dairy trade.

This year I visited some places where creameries had been lately established. We had gone thither in the spring to advise the people on the subject, and in August or September, on our return, we found everything in terrible disorder. The people exclaimed: "Last spring, you told us we might expect such and such a yield from 100 lbs. of milk, and what happens? We have got much less than the next factory; they got, there, 60 cents the 100 lbs., and we only 53 cents." The factory was in great danger. I asked the maker if he was in the habit of testing the milk. "Sometimes," replied he.—"And the result?" "Ah! very poor." Others said that they did not test the milk. But in each case, duty had been neglected: in one, by not testing the milk, in the other, in not taking means to conquer the evil.

And first, without wishing to insult any one, I say that the patron who puts water to his milk is a thief. He robs his fellows as much as if he put his hand in their pockets. And, sad to say, there are people who would not take a copper left on the table, who still are not afraid to water their milk. It is not only we who sin in this way; I don't intend to blame the French-Canadians alone. I have heard the patrons are just as bad, even worse, in Ontario.

If this state of things goes on, what will become of us? Our factories will be ruined. Those who wish to go actively to work at dairying will be discouraged, and we shall fall back into the same situation we were in 12 years ago. Do we mean to consent to lose the fruits of 10 or 12 years work? We are doing our utmost to develop the dairy-industry: do we intend to run foul of, and get crushed by this thing: fraud? Turn we back then; let us address

ourselves to the conscience, or if that is deaf, let us address ourselves to the law. Where the general interest is concerned, we ought not to trouble ourselves about the danger of wounding personal feelings, and we must rise up against this custom, which is becoming a national sore.

We spoke at length yesterday about syndicates. We ought to do all in our power to work in favour of them, and to establish them on a fitting basis. We must try to get good inspectors, and, also, to get dairy schools instituted. Proprietors of factories have often asked me to find them capable makers, but I hardly ever can recommend them any, because the good ones are all employed, and I cannot take upon myself to recommend the others. The school will fill up this blank.

This school must be a practical one. Some one said here: We are not opposed to the creation of a school, but we know, by experience, that most of those who study in these schools, and gain theoretical instruction, are not prepared, when they leave, to go to work practically. It is just this that I am opposed to. If our school were only a theoretical one, where the pupils would be taught, for instance: "you are to heat up to such a temperature;" without making the pupil do the thing himself, I admit that the lad, on leaving such a school, would not understand his business. What I want is a practical school, a school in which mistakes would be made on purpose: to show how to remedy them. I know a maker who was greatly embarrassed the second day he was working all by himself in a factory; he had just received some bad milk, and in the factory where he had studied there had never been anything but good milk. Therefore, in the schools we are looking for, milk out of condition must sometimes be set to work upon, that the pupil may know how to get himself out of the scrape when such a thing happens in a factory. If we succeed in getting a school of that sort, you may be sure it will be productive of excellent results.

I forgot to mention one idea that had been suggested to me, and which Mr. MacPherson laid great emphasis upon in his lecture: the improvement of milk that is out of order owing to want of aeration. What is the aeration of milk? It consists in, when the milk has been strained, causing the air to penetrate through it by pouring it from one vessel into another, or by passing it over a certain apparatus made for that purpose, to get rid of bad smells. Unfortunately, these apparatus are but little known, and it has been suggested that the association should take upon itself, not to furnish the aerators, for it has not the means, but to buy some, and sell them at cost to the farmers.

There is no doubt that many defects in cheese are due to the non-aeration of the milk. In spring and autumn, milk has many bad smells, owing to the cows inhabiting badly ventilated buildings, and it is very easy to get rid of the smells by aeration. If this is not done, bad milk will be taken to the factory. The popularising of these aerators would do a great deal of good.

I was happy to hear, yesterday evening, M. Beaubien expressing the great respect we entertain for our clergy, and the way in which we count upon them for guidance, not only in our religious affairs, but also in our material interests. In our province, it is a characteristic of the nation, this respect joined to unlimited confidence in the clergy. We have been accustomed to be guided by

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them, not only from a religious point of view, but also in our temporal affairs, and we have always benefited thereby. In our new parishes, the priest always accompanies, and sometimes even precedes, the clearer of the bush. In another order of ideas, let a priest be at the head of any enterprise, and at once, confidence in that enterprise is acquired, and all goes well. And in thus expressing myself, I do not speak only from the point of view of a catholic: our protestant fellow-citizens are the first to respect these feelings, and most of the strangers among us do the same. Our Dairymen's Association has not been neglected by the clergy; we have a great many priests among our members, and we have even had a bishop in our ranks. To these gentlemen our thanks are due for the aid and encouragement they have given us; we owe to them the expression of our gratitude, and we should strive to interest them as much as possible in our affairs, for, then, we shall be certain they will go on well.

In conclusion, I will reply to an objection that I have often heard made by people who are not engaged in this movement. It is said: "You talk about the dairy-industry, the dairy-industry, and again of the dairy-industry; but, after all, there appears to be, for the farmer, nothing but this dairy-industry." They would appear to think that all our labour is for the dairy-industry, to the exclusion of every other industry. Those who talk like this do not understand our programme. If we have taken the dairy-industry for our programme, it is because we have come to the conclusion that, in these times, it is the only industry capable of regenerating our agriculture. We do not talk about the dairy-industry only because it enables us to produce butter and cheese from our milk, but because it also offers us the best means of restoring fertility to our land. And so, when we speak of the dairy-industry, we are speaking particularly of it in relation to that part of the province in which the farms are ruined, and have ceased to give their former results. And there, dairying is their salvation. Why? Because, not only is it consistent with the production of milk, but because it necessitates the observance of good rotations and a sensible system of farming, as well as the rearing of good dairy cattle, which in their turn make manure, and this system carries off less of the nutritive principles of the land than does the cultivation of grain crops, or of hay sold in the market.

An example: You manure an *arpent* of land with cow-manure; on this arpent you cut a crop of green-meats for your cows; next year, you grow wheat on this well manured piece, on which the following year will grow a good hay-crop, and, subsequently, pasture. It is thus that link after link forms the chain. We don't dairy for the sake of dairying, but because it is the system of farming the most within our reach; it is even the only one we can undertake successfully, while at the same time we are restoring the fertility of our exhausted farms.

J. C. CHAPAIS.

REPORT OF MR. C. C. MACDONALD.

Mr. President and Gentlemen,

I submit to you my first annual report, for the year 1890, as instructor in cheese making, for the Dairymen's Association of the Province of Quebec.

My inspection began on May 5th, and ended October 5th. It included 15 counties: Arthabaska, Bagot, Chateauguay, Drummond, Laprairie, M. isisquoi, Nicolet, Rouville, Richmond, Shefford, Stanstead, St. Hyacinthe, Verchères, Wolfe, Yamaska.

Altogether, I have visited 115 factories: 113 cheese-factories, one creamery, and one combined.

In spring, I found most of the factories turning out their cheese in a soft, pasty condition, and this on account of the too low temperature maintained during the course of its making, and later on in the fermenting room.

The cheese-factories are in general badly built, and the fermenting room, in particular, is not sufficiently closed, so as to enable the temperature to be regulated. If we aim at producing cheese of first quality at every season of year, an indispensable condition is that the factories be so built that too much heat in summer and too much cold in spring and fall, can be excluded. Seventy (70° F.) degrees is the temperature to be maintained in every season.

During my journeys, I observed many of these small establishments badly built, with defective fittings, poor utensils, and under the direction of incompetent cheese-makers, who are unskilled in their business, but are content to work for low wages. The wages of such makers are always too high; we must try to get rid of them, in order to enable capable and conscientious makers to strengthen their position. I hope my remarks will not be found too severe, but I feel it to be my duty to lay these things before you in their proper light.

I am sorry to say that I found most of the factories in my district dirty and, in general, badly kept. It is hopeless to try to make good cheese in a dirty workshop. A cheese-maker may in vain treat his curd in the most careful way, with the greatest knowledge of his business, but if his factory is carelessly kept, all his work will be wasted. A vat, a press, or a floor, in a dirty state, will always make the cheese lose its flavour.

The maker, therefore, can never take too much care in keeping his factory clean and free from all bad effluvia.

Nothing gives me more pleasure than to see a cheese-factory clean both on the outside and in the inside.

A maker should expect that his working days will be long; show me the man that is to be found in his factory up to 5 and 6 o'clock of an evening; his establishment will infallibly be found in a perfect state of cleanliness, and his cheese will be excellent.

Water is to be found everywhere in Canada: why, then, do we not use it to give our butter and cheese-factories that cleanly look that captivates the buyer? All the vessels ought to be washed and scoured out at least twice a week.

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The lid of the vat ought to be set out of doors every fortnight, to prevent its accumulating anything that might give it a bad smell. The moulds and bottoms must be washed and aired every day; the press-cloths kept soft and sweet. I have had trouble enough to get attended to on this point; I have met with makers who use the same cloths in the presses until they become stiff and hard. Without cloths, it is impossible to give a neat surface to the cheese. As soon as the cloths become even a little hard, they ought to be thrown into the fire, and others put in their place. The floor of the factory should be kept perfectly clean; the rakes, curd-knives, and everything connected with the manipulation of the milk or the curd, must be washed every day.

In the course of my visits, I had only to examine the vat-room to know beforehand what sort of cheese I should find in the fermenting room. I, unfortunately, found many makers whose sole ambition was to make cheese as good as their neighbour made. Each maker ought to aim at a higher flight than that; he ought to aim at making cheese not only as good as his neighbour's, but cheese that cannot be surpassed in the Dominion. I should be glad to see every maker also an *experimenter*: this would be a great assistance to the instructor, and would facilitate the discharge of his duty.

The creamery of M. Chicoine at St. Marc, that I visited, showed butter of the best quality, as did the combined (cheese and butter) factory of M. Archambault at St. Hyacinthe. The August cheese was, this year, in better condition than usual; but when the cold weather began, the cheese showed a tendency to become pasty; which is due partly to the low temperature of the fermenting room, partly to the low temperature during the manufacture.

In making fall cheese, it is necessary to be able to keep up a temperature of 98° for four hours after the whey is drawn off; then grind the curd, and let it cool down to 85°: let it remain in that state for two hours; salt it, at the rate of 3 lbs. to the 1,000 lbs. of milk; mix thoroughly, and as soon as the salt is dissolved, and the curd has regained its original consistence, which it will generally do in 25 minutes—put it to press, pressing lightly at first, increasing the pressure every half-hour, during the two first hours; then, every hour till bedtime; and the first duty of the morning will be to increase the pressure.

As I said before, the cheese-maker ought not to hurry over his work. I am sorry to say that, in many cases, I found the makers already gone from the factory at 3 o'clock—sometimes even at 2 o'clock, in the afternoon. In these instances, the cheese was soft and open (*what our Gloucestershire tenants call "raised."* A. R. J. F.)

The superintendence of the cheese-maker should never cease from the reception of the milk to the sending off of the cheese to the purchaser.

Last July, the makers were tormented by the cheese being full of holes or gassy, and having little flavour. Cheese with these faults (*piqué and gazeux*) is caused by the milk not being properly cared for, either in that the cows have been allowed to drink stagnant water, or because they have been "chevied" immediately before milking. (Cf. *Chevy-chase* on the *Cheviot-hills*, A.D. 1388. A. R. J. F.)

Cheese wanting in flavour: this comes frequently from the above causes. It arises, too, from impure effluvia which are disengaged in dirty factories.

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Let the maker begin by keeping his factory in perfect order, and then he will be in a position to exact from the patrons the delivery of the milk in perfect condition and cleanliness. He ought to be the first to set the example.

It should be the ambition of all the patrons that the factory to which they carry their milk be the best in the country.

Suppose the milk all delivered and at the temperature of 90°. Let it cool down to 86° before adding the rennet. Then, to every 1,000 lbs. of milk add from 2½ lbs. to 3 lbs. of rennet, according to its strength. Leave the vat uncovered at all seasons of the year. When the coagulated milk breaks under the pressure of the finger, take the vertical curd-knife and cut it in the direction of the length of the vat (*sur la longueur du bassin*), taking care to hold the knife perfectly straight. Then take the horizontal-knife, and pass it too in the direction of the length of the vat; then, for the last cutting, pass the vertical-knife across the vat. This completes the cutting.

Stir, then, for ten minutes. Let on steam, gently at first, increasing its flow as the whey leaves the curd; the stirring must be continued while the steam is coming in. Heat up to 98°, even 99° will do no harm. As soon as the steam is shut off, stir the curd quickly for ten or fifteen minutes, to prevent it from sticking to the hot vat. Then draw off the whey to the level of the curd. This is the time to give body to your cheese. Stir continuously until it gives to the hot iron threads ½ of an inch long. Draw off the rest of the whey, and then give the curd a good stirring, with the hand, for, say, 20 minutes. Next, heap it up, but not too high; cover it, and keep up the temperature to 98° for 4 hours; turning over the curd as a whole (*en bloc*) every 20 minutes for the first 2 hours, and letting it remain undisturbed for the remaining two.

Then, grind it and let it cool down to 85° or 87°, leaving it at that temperature 2 hours, but moving it from time to time. The curd is now ready for the salt; put from 2½ lbs. to 3 lbs. of salt to the 1,000 lbs. of milk. As soon as the salt is well mixed in, which will take from 20 to 25 minutes, the curd is ready for the press.

The first effect of the salt on the curd is to harden it, but as soon as the salt is dissolved, the curd becomes soft again.

This way of treating gassy cheese, takes six hours after the drawing off of the whey, and for certain kinds of impure milk, even longer; but this method secures the best results.

I have always found it the most difficult of all things to get the makers to hand-stir the curd enough; although it is an important point, for this stirring, drives off the excess of moisture that may be present; and it is while the acidity is being developed in the whey, up to the eighth of an inch, and solely during this time, that a firm and elastic consistence can be imparted to the cheese; if it is neglected, the cheese will be soft and pasty.

Boxing the cheese, is a very important point in the manufacture. Weigh the cheese with exactitude; adjust the boxes perfectly to the cheeses, so that the cover of the box may rest on the side of the box, and bear lightly on the cheese; strengthen all the boxes that look weak, and nail on the covers

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firmly. Invent a trade-mark, and fasten it to the side of the box, and mark the weight of each cheese on the right of the trade-mark.

This gives the boxes a pleasant look, and, as indeed ought everything the maker does, should be executed with zeal and good taste. To avoid the fly, many makers keep the fermenting room close and dark; this is a mistake, for much light and pure air are requisite for the cheese-room. Still, avoid too much sun.

It is, of course, impossible for either a maker or an instructor to make good cheese in a factory from which the means of making it properly are absent. Let us study the best methods of treating milk, establish good, well built factories, and our manufacture of cheese will be as prosperous as we can wish.

Few cheese-factories have stoves; the consequence is that the cheese in spring was pasty, cold and viscous; whereas, if the maker had expended a few dollars in warming his fermenting room, the cheese would have been in perfect order.

Turn the cheese regularly every day; wipe off the mildew, if any appear, and try everything in your power to give the cheese a tempting surface.

While turning the cheese, take care not to break or damage it. Use a great deal of whey-butter: nothing is, in my opinion, so well fitted to keep a smooth, pliable surface on the cheese as whey-butter.

There is, in cheese making, a vast field open to improvement. I only regret having had such an extent of country to run over in such a limited time; one man cannot inspect such a number of factories with success and profit. At most, 25 should be his limit, so that he could visit every one every month, and superintend them properly. Things ought to be so arranged that the instructor should pass one entire day in every month in each factory: you would soon see the good it would do.

One cause of embarrassment for me, in the spring, was, that being a stranger, I had great difficulty in finding out the places; but as the season advanced, I became familiar with the country, and this cause of worry vanished. All proprietors of factories who wish to become members of this association ought to do so early in spring. The inspector receives orders to visit a certain district: he inspects all the factories on his list; he goes off to another district, and there receives the names of new members, whose factories are situated precisely in the parts he has just been going round; he has to turn back, and this causes a waste both of time and of money.

In conclusion, I thank from my heart the people of *your* province for their goodness and cordiality, and I can assure the people of *my* province that I have found among you true and loyal friends.

I am beginning to speak French with greater fluency; and I am glad of it, for when I began to work among you, it was one of the things that worried me most. But, as the season advanced, I became more familiar with the language, and I felt that my explanations were clearer and more easily grasped by my hearers.

I must say that the finest landscapes I have seen in Canada are to be found in some of the parts of the Province of Quebec where I have been.

I anticipate with pleasure the time when the products of Quebec and Ontario will be sought after by the whole world. Thanking you for your kind attention,

I have the honour to be,

Mr. President and Gentlemen,

Your very humble servant,

C. C. MACDONALD.

THE MANUFACTURE OF CHEESE.

LECTURE BY MR. D. M. MACPHERSON.

Mr. President and Gentlemen,

I am happy to meet so many makers of dairy-goods, and so many farmers, all devoted to the dairy-industry, and come here with the purpose of gaining instruction. I am sorry I cannot speak French: I consider that in this country every Frenchman ought to be able to speak English, and every Englishman should be able to speak French. I congratulate the directors of the association on this successful convention.

We are at present in a period of study and research. The farmer and the maker are both of opinion that we must endeavour to produce the best article possible, so as to get the greatest possible profit out of it; and it is being asked, if the farmer is getting out of his farm all the profit it is capable of yielding. The farmer finds it, naturally, more difficult to produce 5,000 lbs. or 6,000 lbs. of milk per cow, or two or three tons of hay per acre. More skill, more intelligence, and more foresight are needed to grow a greater crop of any kind, but if it is done, the return made is sure to pay for it. It may be said that, generally speaking, the produce of a farmer as regards the dairy-industry, is the measure of his intelligence.

When we have reached a ripe age, we are not expected to go to school, but these conventions are in fact true schools, destined to develop the intelligence of the people, with this difference: they bring within reach of the people science ready made; while in ordinary cases, it is the people who have to put themselves out of their way to attend school.

I am more and more convinced of the increasing importance of the dairy-industry to this province. It is of immense interest to each individual, to each district, to the whole country: in the whole extent of Canada, there is nothing equal to it.

There is still a great deal to be learned in the dairy-business, and still more to be made practically useful, of those things we already know. I must tell you that I have studied the manufacture of cheese for 21 years; I have devoted much time, much attention to this study; I have observed much, but I think I made more progress in this art during the course of last year, than I

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had previously made during the time that had elapsed since I began. I feel that there is a great deal more to be learned, many discoveries to be made, before the cheese-makers shall be able to control effectually all the agents that are concerned in the manufacture of cheese, before we can turn out uniformly that quality of cheese that we ought to produce.

I am about to presume to give certain advice, to make certain suggestions to the cheese-makers and the "Dairymen" who are present.

To the *dairymen* (farmers who devote themselves to the dairy-industry), I will say: the first thing you have to do is to remodel your farm buildings. They have done you good service in the past, but in most cases, their utility is over. First, the cow-house ought to be a manure-factory, perfectly arranged (*aménagée*). No farmer, no dairyman, can farm successfully without dung. Every manufacturer should not only make the best possible goods, but he must not allow the goods he has made to go to waste. What would you think of a manufacturer of cheese, who, after having produced cheese of the finest quality, should afterwards expose it to the sun, to rain, to bad weather, where it would lose half its value? Would farmers patronise a factory of this sort?

In building a cow-house, three things ought to be considered: 1. The preservation of the manure; 2. the preservation of the health of the cattle; 3. avoiding giving useless work to the hands.

Every farm intended to be conducted with a view to keeping horned stock, ought to have not less than one head of cattle to every two acres; and in winter, if possible, one beast to every acre of the farm. Here, comes in ensilage, which is, I believe, one of the grandest discoveries for the farmer ever made. I feel, gentlemen, that the real value of ensilage will never be appreciated, until every farm of 100 acres, or more, shall have its silo. Then, alone, will its numerous advantages be discovered. The silo offers this advantage, that, when the cow-houses are properly arranged, the cattle we keep this year, will be occupied in preparing the food of those that will follow next year, in as great, or even in greater numbers; and will, at the same time, be making good profits for their owner. In other words, it is a means of increasing, year by year, the fertility of the soil, and by making profits, increasing the prosperity of us all. Another advantage arising from the silo is, that by increasing the fertility of the land, it increases its value, since it augments the profits to be derived from it.

When farmers, "dairymen," can keep a cow per acre (I believe this can be done), when they get 5,000 lbs. to 6,000 lbs. of milk from each cow, when this milk is of such superior quality that the makers can increase the quality of their goods; it is then, gentlemen, that we shall find out what enormous profits the dairy-industry is capable of making.

You were speaking, yesterday, of factory-syndicates for inspection. There have been up to the present two or three inspectors for the whole province. These inspectors have done a great deal of good, but there are not enough of them for the task; and we must have recourse to a more effectual style of inspection. Every syndicate of 30 or 25 factories should have its own inspector. I hear that the government is going to subsidise this business liberally; but we must not expect the government to do everything. Each must do his part; and the

factories must unite in syndicates of 30 factories as I said, in order to have inspectors.

In most instances, the inferior makes of butter and cheese may be attributed to the bad condition of the milk. Farmers then ought to try to milk their cows in a cleanly fashion, and to strain and aerate the milk properly. The milk ought to be taken to the factory in a sweet, fresh state, and be capable of retaining that condition for three or four hours after its arrival.

And, now, for a few words to the cheese-makers. Every cheese-maker ought to have an idea, clear and precise, not of the sort of cheese he wishes to make, but of the cheese he must make; that is, cheese that will fetch the highest market price. In other terms, every maker ought to have an ideal cheese in his eye, and know how to set to work to realise this ideal: 1. to know what has to be done; 2. to know how to do it.

Every maker ought to carry with him a *taster*, and try to make himself a judge of cheese in every possible way. He must try to perfect himself in his work by travelling and by visiting other factories. I think one of the great faults of makers is, that they do not visit other factories often enough. It would be to their interest, were they to visit the establishments that make the best cheese, and try to discover the real causes of that superiority. This is one of the best ways of learning to make cheese that shall fetch the highest price.

The highest priced cheese may be thus defined: a cheese that is delicate in its texture, of firm consistence (that is, of sharp fracture, neither sticky nor dry), but rich and with a buttery flavour, and of long-keeping quality.

To be sure of making cheese of this kind, all bad milk must be rejected, whether its badness be owing to evil smells, or to any other faulty condition. If the milk is too sweet, *i. e.*, if it is in such a condition that it would keep sweet for 7 or 8 hours, it ought to be heated to 90° or 95°, to get it into proper order for making into cheese; so that it should remain sweet during not more than three hours after heating.

In making cheese, you only take away one element of the milk, and, in compensation, add another. You take away the whey, and add the rennet. But to obtain a good result, there are three conditions which must be kept in *equilibrio*: acidity, moisture, and temperature.

The degrees of acidity and of moisture give to the cheese its characteristic *temper*, as steel has its own. If the tempering is done at too high a degree of heat and moisture, the cheese will be brittle; if on the contrary, there is not enough acidity and moisture, the cheese will be sticky and pasty. A similar thing happens in the tempering of steel.

This that I am saying is a novelty, it is only this year that I thought I saw some analogy between the action of acidity and moisture in cheese, and that of certain agents in the tempering of steel. We want well-tempered steel to have an edge, sharp and almost transparent; the edge (*arête*) of good cheese, where it is cut, must be clear and almost transparent.

The rennet must be pure and of sufficient strength: every maker knows that, since it is the rennet that separates the curd from the whey.

Another important matter is to have accurate thermometers. I find many of the thermometers we buy far from correct. They are often erroneous by

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2, 3, 4, and even 5 degrees, which is enough to put an end to all good making of cheese.

Another most important thing is the time at which to draw off the whey. The proper time is indicated by a certain degree of acetification, which can be determined by means of the hot iron. If the curd is soft and full of whey, the latter must be drawn off the sooner, to allow the fermentation to develop itself.

It is of the greatest importance to draw off the whey at the proper moment, to impart to the cheese that *temper* of which I spoke, and which develops itself under certain degrees of moisture and acidity. Makers in general are supposed to know the hot-iron test, but in every case, I may state that the length of the threads from the hot-iron should not exceed 1-16 to $\frac{1}{8}$ of an inch. So much for the acetification. As to the proper degree of moisture, it is to be determined in this way: first, by the sense of touch, then, if on chewing the curd, the same sort of sound is produced that the chewing of a piece of India-rubber produces under the same action, the degree of moisture is sufficient.

Another most important point, which is often neglected, is the maintenance of a regular heat in the curd. During the $3\frac{1}{2}$ or 4 hours that follow the drawing off of the whey, the temperature of the curd should never be less than 95° . Without that, the texture of the cheese will never be firm. An equal temperature is best maintained by covering the vat with a cloth, or with clean salt-bags. These salt-bags are, in my opinion, the best covers for the purpose. The curd must not be soft and crush itself, or spread itself out, during this period, as many seem to think.

Grind the curd at about from 85° to 88° .

The curd is then cooled down by degrees to 80° . This is a new idea that came into my head last year. As soon as the curd is ground, let it wait 2 hours, and then put it to press at from 80° to 75° . If it goes to press higher than 80° , the cheese will not preserve its flavour so well. This also is a fresh point I found out last year.

People do not give enough salt in autumn, as a rule. In September and October, I give $3\frac{1}{4}$ lbs. to $3\frac{1}{2}$ lbs. of salt to the 1,000 lbs. of milk.

The great cheese exhibited here before the convention, is a good one, but it was allowed to cool too much; the curd was not kept long enough at the high temperature after the whey was drawn off and before it went to press. There was not enough salt put to this cheese.

Rennet has two properties: in curd kept above 96° , it drives out moisture, thereby making the curd dry; and if the curd is kept below 96° the action of the rennet is to make the curd absorb moisture. Thus, this cheese, judging from its appearance, was kept at only 90° to 93° , after piling up: it has absorbed too much moisture. I am speaking, you will understand, of the moment when the whey was drawn off, and not of the moment when the rennet was added.

The richer the milk, the higher it must be heated; and very rich milk may be raised up to 99° or 100° . In this province, I should advise heating up to 100° , to make a more solid cheese; heat up to 100° , and cool down to 98° , and continue to cool gradually. If you want to make a soft cheese, like the red one

exhibited here, you must heat up to 98° and cool down to 93°. But the practice is not one to be recommended.

Cheese worked at low temperatures retains more moisture. Moisture is present under two forms: first, in the free state, and, next, in the cheese itself, and in such a state that it cannot be expelled by pressure. This moisture that cannot be expelled by pressure, makes the cheese pasty and sticky, if it be present in too great quantity. The reason why many makers turn out sticky cheese in the fall, is that they do not manage the temperature aright, and allow the cheese to get too cool at the commencement of the operation.

The pressing must be thorough. No fear of pressing too much; even if a little fatty matter, butter, should exude, this is not a bad sign. You cannot press too much. If the cheese is of good quality, you will never see butter exude round the edges of the cheese. The pressing must be carefully watched; attend to it every hour, and increase it so that the pressure may act uniformly until it be completed. I find the old upright wooden press, very strong, with wooden moulds, to be the best; every mould should have its own separate screw. Wooden moulds are better than iron ones, because they enable one to make a cleaner cheese, and do away with all the unsightliness caused by the iron moulds, which get rusty, and leave marks on the cheese; which marks many buyers object to. The bursting of cheese is often caused by the fact that the cloths employed are sour and dirty, as well as the wooden rounds (*rondelles*), the covers; and the pieces of wood that are underneath the cheese are often dirty too.

DISCUSSION.

M. COTÉ—Would Mr. MacPherson tell us why this cheese that is on the table is cracked?

MR. MACPHERSON—From want of sufficient pressure.

M. CHAPAIS—Do you think that is the only reason?

MR. MACPHERSON—It may also have been put to press too cool.

M. A. GÉRIN—If the temperature is one day 70° and the next day 50°, is not that enough to make the cheeses crack?

MR. MACPHERSON—No. I have gone over all the most important points in the art; I shall now be happy to answer any questions that may be put to me.

M. CLÉMENT—Is the rennet we find on the market considered the best? You said that the quality of the rennet affects the quality of the cheese.

MR. MACPHERSON—All the preparations of rennet are good, provided the aroma is good. Rennet, the aroma of which is faulty, should not be used; apart from that, it is a mere question of choice.

M. CLÉMENT—There are several brands of rennet on the market; do you know which is the best?

MR. MACPHERSON—There are four of the best quality.

M. CLÉMENT—Would you name them for the benefit of the makers?

MR. MACPHERSON—This might perhaps be sounding my own trumpet. For the last four years, I have used Van Hasselt's rennet; no better can be found.

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Wherever I have used it, I have always been satisfied with its effects. There are, besides, Hansen's, Arnold's, and Blumenthal's.

Another point is the water. Nobody can make good cheese if he uses bad water in its manufacture; it will at once spoil the flavour of his cheese.

M. CLÉMENT—I see that you advise putting the cheese in press an hour or two after being ground: generally in factories, they put the cheese in press half an hour after grinding; will you tell us in what way this harms the cheese?

MR. MACPHERSON—If it is put in press at the end of only half an hour, you have not let it cool enough; an hour or two is necessary; that will give the cheese a silky texture. Cheese must be allowed time enough to cool and absorb enough moisture, if it is to have this silky texture. This, too, is a new discovery I made this year while making cheese.

M. CLÉMENT—Suppose that it was cool enough in half an hour, or in three-quarters, would pressing it then hurt the cheese?

MR. MACPHERSON—It would not do so well. When the weather is cold, I do not advise waiting till the curd becomes soft while it is hot. It must be allowed to become soft when it is cold. This is a blunder that makers generally commit; the allowing the curd to become soft while it is hot. Still, if the cheese were at a lower temperature than 75° to 80° , it would be difficult to press it equally all over. The reason why we have mealy cheese (*farineux*) is, that it was not ground at a sufficiently low temperature, but at too high a one. This is why I advise keeping the curd an hour or two after grinding, before putting it to press. This increases its flavour. Cheese made like this will keep its flavour for years, if the milk and the water employed in its confection were good.

MR. BOLAND—Is rennet in powder good?

MR. MACPHERSON—It is good, but I find it is twice as costly as the liquid rennet.

MR. BOLAND—Why does the whey sometimes exude *white* from the cheese?

MR. MACPHERSON—Because the curd was too hot when cut, or because too much moisture had been left in it, or because too much whey was left in the curd when it was piled up in the vat.

MR. BOLAND—Why does butter sometimes exude from the side of the cheese?

MR. MACPHERSON—I never saw butter behave in that way; but, it is caused by the curd being too dry, because it received too much hand-stirring.

A VOICE—Is it because it was too much stirred when the whey was drawn off?

MR. MACPHERSON—Perhaps; before piling it up in the vat; the curd would have been made too firm; it would then be so dry that it would crumble, and the butter would exude from little holes through the cheese.

M. CLÉMENT—What is the proper temperature for the fermenting room?

MR. MACPHERSON— 70° to 75° . If the cheese is made after the principles I have laid down, it will bear 5° to 10° more without damage, but the best is 70° to 75° .

The great point of all to be observed in the making of cheese is the perfect regulating of the temperature, when once the whey is drawn off, in order

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to produce that *temper* I spoke of this morning. If you have too much whey in the curd, you will have it sour and the cheese will be mealy, *i. e.*, it will have about the consistence of brown sugar, like flour, all in grains. If there is not enough moisture in your curd, little bladders of butter will form in it (like as in *Gruyère*—A. R. J. F.), the cheese will be poor, and will not keep its flavour, it will be leathery, with no silky texture, a cheese like cork.

M. COTÉ—Is it a great defect if cheese allows the butter to escape at its sides?

MR. MACPHERSON—Of course there is a loss; and more, this deprives the cheese of its flavour. The cheese shown here, would never let butter exude from it, even if a pressure of 100 tons were put upon it. It was put to press too cool; and in consequence, it absorbed more moisture than it ought to have absorbed. Still, I call it a good cheese.

M. BRODEUR—One of our best makers says it is as good as any cheese made in Ontario.

MR. MACPHERSON—It is a good cheese; but if you study it with the critical eye of a professor, you would say that it would be worth a quarter or half a cent more, if it had less moisture in it. While it is a good cheese, it has that fault.

MR. BOLAND—What is the best temperature at which to put rennet to milk?

MR. MACPHERSON—80° F. to 84° F.

MR. BOLAND—What effect has putting whey into the milk?

MR. MACPHERSON—It is the surest way of spoiling the cheese.

REPORT OF THE COMMITTEE ON THE SAMPLES OF SILAGE.

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

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

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

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

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

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

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

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

MR. FISHER—Yesterday evening, M. Choquette asked me to say a few words on the best way of sowing maize for ensilage. Should it be sown thick? At what distance between the rows, and between the plants in the rows? We are, at present, satisfied, that in order to enable the sun and air circulating around the crop to bring it to a proper degree of maturity, ensilage-maize should be sown as thin as possible.

M. MOREAU—As we are talking of siloes, may a lawyer be allowed to ask a question. I have met several farmers who asked me how a silo was made: people have been "talking siloes" for a long time; how are they made? "Are they under or above ground; can we build them ourselves, or must tradesmen be employed; are they low-priced or costly?"

M. BRODEUR—As you see by Mr. Fisher's report, though I may know how to make a silo, I do not know how to make silage; but I beg Mr. Fisher, who is well skilled in both making, and in judging of ensilage, to give us a description of his silo. He is the member for his county, and one of the oldest silage-makers, so he can give you all the information required.

MR. FISHER—It is rather hard for me to express myself in French with sufficient clearness; but the answer, sir, is simple enough. In fact, the question has been answered over and over again in every part of the province. But as I am not perfectly familiar with French, I should prefer that Messrs. J. C. Chapais and Brodeur, who are better informed on these subjects than I, should reply in French.

M. MOREAU—I will ask you a question, and you will only have to answer. How much does a silo cost?

MR. FISHER—Fifty cents per ton of contents, if built in a barn; and \$1, for the same quantity if a separate building.

M. MOREAU—Can an ordinary farmer, with his unaided skill, build a silo?

MR. FISHER—If he can put up a barn, he can put up a silo: the frame is the same in both cases.

M. MOREAU—Is it absolutely necessary that the silo be above ground, or may it be sunk in the ground a little?

MR. FISHER—I, for my part, prefer sinking it a little—two or three feet, perhaps, for there is a heavy pressure on the bottom of the silo, and it would stand the weight better if it were a little sunk in the ground.

M. MOREAU—The sides must be hermetically closed?

MR. FISHER—That is absolutely necessary.

M. MOREAU—And as to the bottom?

MR. FISHER—Let the bottom rest on the ground, that is enough; no need of a floor.

M. MOREAU—M. Beaubien says he covers his silage with a foot or two of straw, and on that he puts dung: do you think that with boards, laid very close together, the dung might be omitted?

MR. FISHER—It would be difficult to lay boards so close together as to hermetically seal anything up. However, I think the straw will close it up tight enough. The chief point is to prevent the air entirely from getting in, and it does not signify how you set about it so long as that is done. If the least air gets into the silo, the silage will rot.

M. MOREAU—How large must the silo be to feed ten cows for the winter?

MR. FISHER—Fifty cubic feet will hold a ton of silage, and a cow will eat perhaps five tons in a winter. All depends, of course, upon what you give her besides the silage. I do not advise giving nothing but silage, it is better to add a portion of bran or of hay. Still, if you are put to it, cattle may be fed on silage alone.

M. TACHÉ—Here is a reply, easy to recollect, to the question of M. Moreau: If you adopt Mr. Fisher's plan of giving supplementary food with silage, one cubic foot of silage per day will be amply sufficient for each head of stock.

MR. FISHER—A cubic foot of silage and five pounds of hay are enough for a cow for a day, and will keep her in milk—and a pretty big cow, too. A Canadian will do on two-thirds of this ration.

M. MOREAU—What is your opinion as to giving green-corn to cows in summer?

MR. FISHER—When the pastures are bare, it is almost a necessity to do so. But if you want your cows to do well on it, you must neither sow it too thick, nor give it them too young. Maize, for this purpose, should be pretty forward.

M. MOREAU—What maize is the best for summer green-food?

MR. FISHER—Take that variety that ripens quickest. If you sow here the Southern or Western corn, it will probably not ripen fast enough.

M. MOREAU—What do you think, Mr. Fisher, of putting salt in the silage instead of covering it?

MR. FISHER—It is of no earthly use.

DR. BRUNEAU—I beg to be allowed to say a few words on the subject of ensilage. At this meeting, it was our intention to give elementary details on siloes and ensilage; we felt that, in this district, where ensilage is not practised, we were bound to give you all the information possible about it. But, as you see, the time of the convention has been fully occupied in useful discussions. More than half the business we had planned to lay before you, must remain undone. Instead of a two-day's convention, it would extend to four days, if all the work before us were to be carried out. And for this reason, M. Chartier, who was to have spoken on ensilage, could not do so: he had to resign his place to others; and I must be allowed to say that the audience listened with great patience to the very long discussions that have taken place. Permit me to congratulate you on this fact, for it shows the interest you take in these questions, as well as the knowledge of them that you possess.

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Allow me now to give a piece of advice to those who desire to understand the way to make silage. Two or three years ago, M. Beaubien published a pamphlet on ensilage: it is to be had gratis, or, at any rate for a few cents. Then, there is the report of the Dairyman's Association for 1889. I hold these reports to be of incalculable value. People do not know what a lot of information they contain, or how much profit may be derived from them. In the one for '89, you will find a lecture by M. Chartier, with developments of the same question by M. Beaubien. You were gratified by M. Beaubien's address of last night; you will be still more pleased when you read what he said last year at Athabasca.

There is a gentleman in the neighborhood of Sorel: Monsieur Hercule Paul, of Ste. Victoire: he is the owner of several cheese-factories. Last year on my road to Athabasca, I met him in the train. Guided by my advice, M. Paul became a member of our association, and I paid his subscription when I paid my own. He received the report for 1889, and all the "instructions" we issued on the best way of making cheese, and of the care to be bestowed on the milk, of which latter leaf he received more than 100 copies. What was the result? M. Paul is present, and I am sure he will not be annoyed at what I am about to say: he told me that after having read the report, after having handed it to his cheese-maker, who previously was not so skilful as the man he had replaced; after having distributed the "instructions" to his patrons; after all this, he declares that the improvement made was immense, for that after having received, up to that time, only the lowest price in the market for his cheese, he had now the pleasure of receiving the highest.

The answers to questions put here are perfect: what Mr. Fisher tells us is worth its weight in gold. He knows what he is about, and you can depend upon his statements as being based upon facts. Still, it is not like having the reports; them you can read over and over again, and the observations will remain more firmly fixed in your minds; so that, you become thoroughly convinced that the thing is not only practicable, but useful, and consequently, the silo is planned and made. I hope that all who are studying ensilage will make it their duty to get these pamphlets.

M. MOREAU—Another question: yesterday, it was stated that to make good butter it is necessary to churn the cream at a certain temperature—say 60°. Well, as we were going to Sorel, a *habitant* said to me: "People say: ah! how hot it is to-day; it must be 80° or 90° F.; ah! how cold it is; it must be 60° or 65°. In the latter case, one freezes, in the other one melts, and still, there is not much difference between the degrees. There are few farmers who know the difference between the degrees, and I think it would be very useful if we could teach them how to distinguish the degree of cold or of heat without using the thermometer.

DR. BRUNEAU—You cannot do without that instrument.

M. MOREAU—I should think that practical men like you could tell us whether it was very hot or very cold; for instance, if 60° is very hot or very cold.

DR. BRUNEAU—In the physical sciences, there is no "nearly."

M. CHAPAIS—You ask if any one present can tell you, with precision, what 60° is. Well! last night, during a short time when I was very hot, 60° was 80° or 90°; and M. Montminy, who was in the same room with me, fancied it was 45°. I thought the temperature of the room was 80°, M. l'Abbé thought it was 45°, whereas it actually was nearly 60°; which is equivalent to saying that the big, fat man was hot, and the other, more slenderly built, (1) was cold. (Laughter).

The man who aims at finding the proper heat with his finger will never become a good cheese-maker. A thermometer is necessary, and only costs 25c. He who has not 25 cents to spend on a thermometer, had better not meddle with the dairy-business.

M. MATHIEU—I should like Mr. Fisher to tell me what he thinks of sowing Canadian maize, letting it ripen, saving the seed, and ensiling the stalks?

MR. FISHER—You might save the seed and use it for other purposes, but I think it would be more profitable to keep stalk and seed together in the silo. My opinion is, that it would pay better to ensile both than to separate them. The seed of the maize and the stalk form two distinct foods, one of which is the complement of the other, which do much more good to the animal when given together than if they were given separately.

DR. BRUNEAU—My impression is that the seed of the maize-plant goes chiefly to form cream. You might possibly have as much milk if you took away the ear, but it would be poorer. You would have to replace the seed you took away by some other grain.

MR. FISHER—The question is: could you replace the seed by a cheaper substitute; I think not, and I hold firmly to the opinion that you would have to pay more for it if you tried to supply a complete ration in that way.

M. MATHIEU—As our Canadian corn is the most precocious variety, do you think it is the most profitable sort to grow? By sowing Canadian corn, you might ensile stalk and grain at the same time; which you cannot do with the other sorts.

MR. FISHER—The whole question sums itself up in this: harvest the maize when the ears are fit to cook for the table. It is not, therefore, necessary it should be quite ripe.

AERATION OF MILK.

DISCUSSION.

M. DELLICOUR—Would anyone kindly tell me what is the advantage of the *aerator* for milk? According to my idea, if the proposal to have aerators made and distributed over the province, be carried into execution, it would be

(1) The word *slenderly*, here translated "slenderly built," has for years and years been anglicised into *slawy*, particularly applied in *stable-language* to a *herring-gutted* horse, that won't *grub* after a long day with the hounds. A. R. J. F.

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M. CHAPAI should do our b best possible cor most of our farm in them all sorts M. DELLICO wolf into the sh are letting in m milk as much as supply of large much better than

M. CHAPAIS— discussion for a long principles. But of the day. It m novel, in the sens a discussion as What M. Dellico remains to be pro terbalanced by th can decide. I sh speaks of his own I assert that neitl

M. TACHE—I this question of th of science to the with wonder of Monsieur Chapai under which the quently, the Am every case in wh ficial. It is proba the milk was pla proved to have bet Mr. MacPhers which are under h

to propagate a scientific blunder. This was proved by the late experiments made in Europe, at the agricultural stations at Louvain and Gembloux. What I am saying applies more particularly to milk intended for butter-making. For making your cheese, the aeration of the milk may possibly be of advantage. In Belgium, where we make a "fancy" cheese (*de luxe*), we have remarked that aeration is injurious to the milk.

As to any smell the milk may have, which is said to be driven off by aeration, this must be got rid of by so arranging matters that the milk, coming directly from the teat of the cow to the dairy, can have no odour but its own natural one. If care be taken to keep milk in a place fitted to preserve it properly, it cannot absorb foreign smells.

M. CHAPAIS—I am strongly on M. Dellicour's side when he says that we should do our best to keep the milk, as soon as it is drawn from the cow, in the best possible condition. But we are now talking about the situation in which most of our farmers are placed, whose cowsheds are so foul that milk absorbs in them all sorts of bad smells.

M. DELLICOUR—But by this process of aeration, you are introducing the wolf into the sheepfold; since in causing the air to pass through the milk you are letting in *microbes* to act as causes of decomposition; while by keeping the milk as much as possible from contact with the air, as we do in Europe for the supply of large towns, you would preserve it from danger of fermentation much better than by aerating it.

M. CHAPAIS—There are two theories before us: ours has been under discussion for a long time, and we have always considered it to be based on sound principles. But we live in an age of discovery, where novelties are the order of the day. It may be that M. Dellicour's theory is correct, but it is certainly novel, in the sense that it is sufficiently new to admit of our theory sustaining a discussion as opposed to it. Time will decide which is the more correct. What M. Dellicour says about the microbes may be all right, but, then, it remains to be proved if the good done by getting rid of the bad smells is counterbalanced by the harm done by the introduction of microbes. Time alone can decide. I should not like to say in so absolute a manner as M. Dellicour speaks of his own theory, that our method is infallible. His may be good, but I assert that neither he nor I can predicate infallibility of either theory.

M. TACHE—Fleischman, a writer on the dairy, has a strong passage on this question of the aeration of milk. He quotes the opinion of European men of science to the effect that there is no real cause for aeration, and he speaks with wonder of the Americans who persist in aerating their milk. As Monsieur Chapais says, this practice is explained by the filthy conditions under which the milk is placed before it is taken to the factory; and consequently, the Americans, and Mr. MacPherson too, have ascertained, that in every case in which the milk has been aerated, the treatment has been beneficial. It is probable that this may have been due to the conditions in which the milk was placed at its first origin, but in every case, the milk has been proved to have been benefited by the process of aeration.

Mr. MacPherson is the proprietor of a great number of cheese-factories, which are under his own management. Near Lancaster, he has an experiment

factory, where, before recommending the adoption of any new method to his makers, he tests it. During the last two years he has experimented on aerated and non-aerated milk, and he is satisfied that the aerated gives the greater yield.

M. DELLICOUR—I will not give my opinion decisively on this question; here, it is, evidently, settled. M. Chapais says that the point is subject to discussion: this I admit. But I do not understand how in aerating, in introducing into the milk microbes, that will develop themselves in a medium in which they meet with suitable food, *i. e.*, the salts of milk; I say, I do not understand how this can tend to the preservation of the milk. In Europe, in Belgium, as in other countries, we cool the milk as soon as possible after milking, to destroy certain microbes. But not all kinds of microbes or *bacteria* are destroyed by cold. To effect the destruction of the latter we heat the milk to a certain degree; in fact, we Pasteurise the milk; but we endeavour to *subduct* the Pasteuriser from contact with the air, for it is from the air that milk imbibes bad flavour and bad smells.

I do not at all see why you place your milk in the very situation where it will absorb bad flavors and bad smells. If we could curdle the milk as fast as it leaves the udder, it would be the best thing we could do. In the comparative experiments at Louvain and Gembloux, it was found to be much better not to aerate the milk, but to heat it at once: to Pasteurise it, in fact. (1)

I thought there was a special reason for doing it here. While waiting for a more scientific explanation, which might be given by M. Choquette, who, I regret to say, is not present, I stick to my own opinion.

M. TACHÉ—The question is: would it be better to aerate the milk, or to heat it first and then cool it down to a low temperature? I think you would have greater difficulty in getting our farmers to do this than to get them to aerate the milk.

DR. BRUNEAU—It is a very important matter: there may be some truth in what M. Dellicour says; but as our time this evening is very short, and as we did not expect this question to be brought up, I would suggest that it be left as it is for the present, and that, at the next convention, the directors of the association see that the subject be thoroughly discussed.

M. MACCARTHY—I have only two words to say: I will reply, in the next number of the Journal d'Agriculture, to the question that has been brought up this evening, and I will treat it thoroughly.

M. TACHÉ—A propos of that, I beg to call your attention to the fact that the Dairymen's Association enjoys the same privileges as the Agricultural Societies. In the course of the past year I received a letter from Mr. Barnard, informing me that the members of the association can subscribe to the Journal d'Agriculture for 30 cents a year, instead of a dollar, which is the ordinary rate.

M. A. E. DESAUTELS—I am a cheese-maker. At every convention I have attended, I have been found fault with. This year, I hoped to have been

(1) Pasteur's book on the preservation of beer, wine, etc., by heating in vessels subsequently closed with cotton wool (batting), is a work to be studied by all who are interested in such manufactures. A. R. J. F.

praised; on terms, I do not our inspector next year.

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M. LUSSIER—] milk?

praised; on the contrary, I have been scolded again! I do not use scientific terms, I do not understand them; but I beg leave to put a few questions to our inspector, Monsieur Painchaud, that I may, if possible, avoid being blamed next year.

Every season, since M. Painchaud has been an inspector, he has told us: This year I visited 100 and some odd cheese-factories; none of the makers are competent for their duties! I wish to draw the attention of all cheese-makers, of all who, like me, are at work, to this fact, and to tell them that when, in his rounds, M. Painchaud visits you, try to keep him, so that he may not come here and say that he has visited a hundred and odd factories, and had nothing but fault to find there. It might be the means of our getting some praise.

This year, we got a double allowance of blame: our dealers begin to get knowing, and to understand cheese better than could be expected. They are such adepts in cheese-making, nowadays, that they can perceive, at Montreal, 90 miles from a factory, that the vat has been washed with foul water. They are such judges of cheese, that they know whether the salt has been pounded by a man or a woman! (Laughter).

It was said that a new kind of cheese had been invented: *pasty*, i. e., yeasty cheese (*à la yeast*): I have been ten years at work, and this is the first time I ever heard of it. I should like this name to be expelled from the association. Some people, better informed than I, said that this yeasty cheese was caused by the gases that were in the milk. Our inspectors have scolded us well, but they have not given us information on this point. I should like to ask M. Painchaud at what point the whey should be drawn off from the curd to prevent the formation of those holes or *eyes*; that is, how long should the threads be?

M. PAINCHAUD—One line, or one line and a-half, for good milk in the ordinary condition; for other milk, a quarter of an inch in the whey. Today, Mr. MacPherson, in accordance with his experiments, says that it is not necessary to give more acidity, but to leave the curd longer, even four hours, in the heap, and, after having ground it, to leave it two hours more before salting.

As for the blame this gentleman awards me for having visited too many factories, that is not my fault. Our orders are to visit as many factories as possible.

MR. DESAUTELS—I do not complain so much of that. What I do complain of is that the inspectors have been finding fault with us for eight years.

M. PAINCHAUD—The blame is not addressed to you more than to others: let those whom the cap fits, wear it.

M. J. N. ALLARD—There is a very simple way of getting rid of these *eyes* in cheese: don't take in any milk from the patrons that is out of condition, and I will guarantee the cheese will be all right. I invariably refuse bad milk; if we give way one inch to the patrons, we risk our neck; nothing is more simple. The first thing to do is to educate the patrons, afterwards we can have our little inquiry among ourselves.

M. LUSSIER—Is the gentleman who has just spoken acquainted with gassy milk?

M. ALLARD—In the hot season, it is common enough. If your water is foul, you will have gassy milk, and your cheese is sure to be full of eyes.

M. LUSSIER—But if the cheese-maker does not know of it?

M. ALLARD—We makers know it by the curd; we learn to judge of it by practice, by the smell. In summer, take some milk that is tainted, and carry it a couple of miles, and you will have something to tell me about it next year. (Laughter).

M. PLAMONDON—I have heard it said that the patrons who furnish bad milk ought to be fined. I am not a cheese-maker, only a patron; and if I were careless enough to spoil my milk, I think fining me would be doing me a service. I think, though, the maker should be fined, not the patron. If the maker was fined when he received bad milk, he would not feel inclined to receive it for fear of losing one of the patrons; and the honest patrons would not let themselves be robbed by the others. When the cheese-makers can say: if I don't do my duty, I shall be fined; every one will do what he ought to do, and everything will go on well.

M. DESAUTELS—If the makers were fined, they would make nothing, for the milk is so often bad, that they would have to pay too many fines to leave anything for themselves.

M. PLAMONDON—They might sue the patrons.

M. DESAUTELS—In order to give the makers influence to get patrons fined, syndicates must be established; in such a case, there would be, behind the maker, a person empowered to enforce his acts, and who would thus cause the fine to be inflicted. When the inspector passes through the concessions, and visits the factories, a word from him would be worth fifty from the makers.

DR. BRUNEAU—That is just what the association proposes to bring about by the institution of syndicates.

M. PLAMONDON—I made that remark just now for the purpose of relating this anecdote: being at the factory one morning, and finding there a can of milk that smelt badly, I said to the maker: "your milk is spoilt, my lad." "Oh, no!" I persisted: "Oh, no! Well, if you have any sense of smell, come here." He said: "I assure you it is good." He emptied the can, and in its bottom were two inches of curdled milk. I called the proprietor of the factory and showed it to him. He said: "That does not make much difference;" to which I replied: "If that doesn't make much difference, why do they bring it to the factory?"

M. TACHÉ—If that happens again at the creamery you speak of (*Wotton*), you have only to tell me.

REPORT OF THE COMMITTEE ON BUTTER AND CHEESE.

M. MACCARTHY—Gentlemen: your committee for the inspection of the samples of butter and cheese has done me the honour of asking me to report on them. Of the three samples of cheese submitted to us, we have decided, that the large cheese is of superior quality, and fit for the export-trade. The two

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small cheeses possess, in our opinion, good and bad qualities perfectly distinct from, and which offset, one another. We therefore decide that the large cheese is to be classed as No. 1, and the two others, though not alike, may be considered as both being in the same class.

Only one sample of butter was sent to the competition for our examination and estimation. It consists of small pats, very delicious looking, and carefully moulded: it is from the dairy of Mr. Fisher, M. P., of the Eastern Townships. Of it, there are two distinct lots, being made of cream derived from two different breeds of cows: 1, pure Guernsey; 2, crossed Jersey and Guernsey. It has only 3% of salt, and is therefore to be classed as fresh or *table-butter*. Its flavour is undeniably fresh, it melts freely in the mouth, not leaving that disagreeable feeling on the palate that is left by greasy butter. The colour, which is natural, is perfect; rather deeper in the butter from the pure Guerneys, than in that from the crosses. The butter is very well freed from butter-milk, and we are happy to be able to congratulate the maker on his success. Still, the maker might do even better, if he would follow the advice which he has been good enough to ask us for as to the development of the aroma.

REPORT ON THE DAIRY-UTENSILS.

M. BRODEUR—I have examined, this afternoon, with M. Gendron, the apparatus for the dairy: a churn and butter-worker, and a kind of strainer for cooling the milk. As nobody has reported on these utensils, I feel it my duty to tell you that this machine for churning, salting, and pressing the butter, appears to me to be a very convenient invention. I think that if any one who had tried it had told us that it worked well, we should have been able to make a more decisive report on it. But for my part, I never saw anything like it. There are certificates to show that the machine does its duty well, so that we cannot do otherwise than say that it is a good apparatus. But, we cannot test it here.

As for the strainer and the milk-cooler, had I not heard M. Dellicour assert just now that milk is no longer to be cooled, I should be inclined to say that it is an apparatus likely to be of great use in the dairy. But as we are on the eve of giving up cooling milk, it will be no longer serviceable. (Laughter). On the other hand, if we persist in cooling the milk, I, if my recommendation is worth anything, warmly commend this apparatus to the notice of the association.

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TREATMENT OF CREAM AFTER SKIMMING, AND NOTES ON CHURNING.

BY M. AIMÉ LORD.

Mr. President and Gentlemen,

In accepting the flattering invitation of the secretary to relate to you the experiments and observations I have been enabled to make at the Butter-school at l'Assomption, I do not intend to deliver a lecture on the fabrication of butter in general; but only to report, as concisely as possible, some experiments on the treatment of cream after skimming, and others on churning.

The following are a few notes with regard to some samples of butter which have been judged and classified by M. MacCarthy.

I beg you to observe, in the first place, that the samples of butter bearing the same stamp, are derived from milk received the same day, the milk of each patron having been divided into equal parts, in the can used for weighing the milk, then skimmed separately with the separator, under the same conditions, and with all possible care. The quantity of milk skimmed *per hour* was also kept considerably below the real capacity of the machine, in order to insure a true and accurate separation of each sample, and a thorough skimming of each of them.

1. The series of samples C. C., from milk of October 25th, is an experiment on the cooling of milk to different temperatures.

The expert found that sample C. A. had the same aroma as C. B., but was inferior to it in every other respect, having no uniformity of colour, caused by want of sufficient working, the salt not having been perfectly incorporated with the butter. Nevertheless, it had the same amount of work as the sample C. B., which was made from cream cooled down to 35° immediately on leaving the separator. This cream was slightly acetified just before churning, whereas, C. A. was made from cream that was too stale. These facts show clearly the disadvantage of churning cream that has been kept too long.

2. The series of samples D. D., from milk of November 6th, is an experiment made on churning at different degrees of temperature. The sample D. A., judged superior to D. B., was churned at 54°, and the other at 60°. In the latter case, the yield of butter was less, but the time of churning was considerably prolonged in the former case. In drawing an inference from these facts, we must not be afraid of prolonging the time of churning, within certain limits, in regard to both quality and yield.

3. This series of samples G. G. G. is the most important of all; seeing that the results obtained by this experiment were that a super-excellent butter was made from cream churned in a perfectly sweet state, directly from the separator, after having been instantaneously cooled down to 54°; the yield in butter was exactly the same as that obtained from acetified cream: a result not obtained.

It may be shown from the table lower down that cream churned an hour after skimming, with the addition of a little salt and some buttermilk, produced

exactly the same as that obtained from acetified. The samples, the expert found, had a nutty flavour

It would be five or six times as much as the others or processes, with the exception of

The milk used in the houses, but it was

DETAILS OF	
Skim ming-	Lbs of milk used
	Revolutions per separator.....
Treatment of the cream.	Lbs of milk skimmed
	Cream cooled at
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	Age of cream, in days.....
Churning.	Acidity of.....
	Temperature of
	Time, in minutes
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But,

1. The cream skimming, to a temperature before churning;

2. A little buttermilk putting the cream in proportion to the

3. About 4 lbs of salt sufficient to make

exactly the same quality of butter as cream kept for 48 hours and slightly acetified. The sample G. C. was judged to be very superior to the other two samples, the expert declaring that the former had a very fine grain (*pâte*), and a nutty flavour that was easily perceptible and very pleasant to the palate.

It would be well to observe that each series of experiments was repeated five or six times, and always gave the same results. Also, that all the conditions or processes have been carried out in the same way for each sample, with the exception of the special point of characterisation.

The milk used in the experiments had been kept two days at the patrons' houses, but it was in perfect order, and, consequently, quite sweet.

DETAILS OF FABRICATION.		SERIES C.		SERIES D.		SERIES G.		
		A	B	A	B	A	B	C
Skim ming.	Lbs of milk used.....	615	615	462	462	402	402	402
	Revolutions per minute of the separator.....	2300	2300	2300	2300	2300	2300	2300
	Lbs of milk skimmed per hour.....	1000	1000	1000	1000	1000	1000	1000
	Cream cooled at once to.....	—	35	—	—	—	54	54
	“ “ gradually to.....	45	—	45	45	40	—	—
	“ “ kept at temperature of... ..	45	45	45	45	45	54	54
	Age of cream, in hours at churning	48	48	48	48	48	1	1
	Acidity of.....	Very sour	Sweet.	Sour.	Sour.	Sour.	Very sweet.	Very sweet.
	Temperature of, when churned,	56	56	54	60	58	54	54
	Time, in minutes, of churning... ..	65	34	95	40	25	75	45
Churning.	Salt added, in lbs	—	—	—	—	—	—	1
	Lbs of sour buttermilk added to cream.....	—	—	—	—	—	—	4
	Lbs of butter.....	30 7/16	30 7/16	23 8/16	22 8/16	21 10/16	20	21 10/16
	Lbs of milk to the lb of butter.....	20 3/16	20 3/16	19 10/16	20 8/16	18 9/16	20 1/16	18 9/16
	The experts classify each series by the numbers that show the range of quality between them.....	2	1	1	2	2	3	1

As to the result of my experiments, I am in a position to show that cream churned sweet has the undermentioned advantages:

But,

1. The cream must have been cooled down, promptly, immediately after skimming, to a temperature of 40° or 45°, and then frequently stirred till just before churning;

2. A little buttermilk, sour but not spoiled, must be added, either before putting the cream into the churn or during the skimming, in quantity proportioned to the temperature.

3. About 4 lbs. of salt must be added to the quantity of this sweet cream sufficient to make 100 lbs. of butter.

Sweet cream, salted in this way, will churn as easily as sour cream. The salt has a chemical effect on the cream that will set it free. (1)

Churning cream in the sweet state, renders the washing of the butter easy of execution; it is freed in the most perfect manner from the *caseine* and other foreign matters; has a fine, firm grain; and stands hot weather better than that made from sour cream.

This butter requires less working in salting it.

If the temperature of the cream is well adjusted in accordance with the temperature of the surrounding air, the yield in butter will be in no way inferior to that from sour cream.

Butter made with sweet cream has the true and natural flavour of butter, depending more on the food eaten by the cows than on the incontrollable variations that take place in the souring of cream.

Although, as I proved last year, cream can be kept for 3 or 4 days, and even longer, without going sour, by cooling it down to a very low temperature, it is always dangerous to attempt it, as cream thus treated takes on a bitter taste, which communicates itself to the butter, and neither washing nor any other process can get rid of it.

Respectfully submitted,

AIMÉ LORD,
Professor of Dairying,
Agricultural College, l'Assomption.

DISCUSSION.

M. DELLICOUR.—I have not been in harmony, to-day, with some of the speakers, but I am glad to have found in the author of this lecture a man who has had practical experience in the matters he has been treating. When he said that, from cream at 45°, he had made butter which was considered to be of finer quality than butter made from cream at 35°, he was completely in agreement with science, and with those ideas I should have been able to lay before you, had I read to you the first part of my lecture.

For, in reality, what is it that gives to butter its flavour, its aroma? It is the fermentation which has already been produced in the cream. The souring is due to the *lactic* fermentation, and by it is produced the decomposition of the materials (*elements*) of the cream. What are called *glycerides*, with bases of volatile acids, or of fixed acids, are formed. It is admitted by M. Duclaux, in France, that what gives the relish, the richness of taste, that fresh nutty flavour to the butter of Isigny, in Normandy, one of the finest butters in the world, is precisely this decomposition of the primary matters into *glycerides*.

Now, it is known that these *glycerides* with volatile acid bases, give good or bad flavour to butter in proportion to the quantity of them present in the cream; and M. Duclaux has shown that they are found to be in direct ratio to the quantity of lactic acid present in the cream. Now, do you ask

(1) *Débarrasser la crème*: Does this mean "cause the butter to come?" A. R. J. F.

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under what conditions the greatest amount of acidity is produced? Science replies that, as M. Lord has just remarked, it is at 45° that this action is most energetic; well, not *most* energetic, but it is under these conditions that it produces that aroma, that rich nutty flavour so much sought after. If you have a lower temperature, you may get a greater yield, but that will not always compensate for the difference in quality. It is on this special point that I should have liked to insist, to tell you under what conditions you ought to keep your cream up to the time of churning. The best temperature, as M. Lord has just stated, is 45° . If the cream has been skimmed by the separator, it should be cooled down to 45° as soon as possible, and kept there until churning is begun. A lower temperature would be injurious. Butter can be made with frozen cream, but you will get from it neither a good yield nor good quality.

As to the temperature for churning, we have been told, I believe, that the best results have been obtained from 54° . I should advise that 55° be never exceeded; but in winter, you may go as high as 61° .

The aroma, too, must be studied. If you churn at too high a temperature, you will burn the cream, and it will lose its aroma.

You will now probably observe: your table butter is sweet; but, here, we want a higher flavour, a butter with a more emphatic aroma. That depends upon the market in which you sell your butter. I will tell you how to manage; give your cream the temperature necessary to obtain the degree of aroma or other properties it is desired to possess. If you are making butter for immediate consumption, take such or such a degree. If it is intended for exportation, the cream must be kept at a very low degree. The butter will have time to *saponify*—if you must have the scientific impression; frankly, I cannot give it in other words. Then a mild butter is required; the cream must be kept at 45° and churned at 54° . So that I agree thoroughly with M. Lord. At present, butter is wanted fit for exportation; I told you this morning that mild butter was the style best for that trade, and I adhere to my expressed opinion.

Keep the cream thus as nearly as possible at 45° , but do not let it get lower than 42° to 43° , for if you do the yield will fall short.

It is not only the quality that must be studied, the highest possible yield must be sought after; the greatest quantity of butter from the cream churned. Keep your cream, but not too long; not more than 48 hours; that is long enough. Why? do you ask me, you are trying to make me enter into the scientific side of the question, which I would submit to the consideration of M. l'Abbé Choquette, were he present, but for me to enter into that matter at this late hour would be to abuse your patience.

Great attention to cleanliness I advise you to pay; keep your cream carefully, churn at the proper speed, work your butter well but not too much. Never touch it with the hand; not only for cleanliness sake, but on account of that element of fermentation, the cause of rancidity, that you would thereby introduce into the butter. Employ a *spatula* or palette; with a butter worker you must have two; with the *spatula* you can turn the butter, but with only one, it must be touched by the hand, which injures it.

I assert that with cleanliness, proper churning temperature, above all the right temperature for keeping cream, the soundest possible butter can be made here. It is only necessary to carry the souring of the cream to the desired point, according to the degree of aroma we want to produce, guided in this by the time that is likely to elapse before its arrival at its destination on the table where it is to be eaten. This suits the taste, the wish of the purchasers. You will perhaps be asked for a higher flavoured butter on the English market. You will send it off in fresh made state; on its voyage it will have time to acquire the aroma wanted.

That is what is done in Denmark: the Danes do not eat fresh butter; it must be salted, which is rendered necessary by reason of the climate in which they live. But the Danes, so renowned for their skill in butter-making, make for exportation a mild butter, which when it leaves the factory has no striking flavour (*ne dit rien*); it might be taken for grease. But taste it a week or a fortnight after it is made; taste it in New York, or even at Montreal—(there is some there), and you will find the flavour aromatic, delicate, and refined.

This sort of butter could be made here, as was pointed out by the studious Mr. Lynch. His pamphlet I read with attention and pleasure. He follows out good principles, and inculcates them on you. And I am happy to meet here some one who follows our mode of manufacture. You must not think that if some inferior thing comes hither from the old countries, no good things ever come thence.

M. MOREAU—Allow me, once more, to rise. We are talking about butter; I want to talk about cheese. You perhaps, think it droll to hear a lawyer busying himself so much with the dairy-industry. Before I begin, I have to tell you that my reasons for so doing are multifarious. The first is a personal, and the second is a public reason.

The personal reason is this: like all good Canadians, I have children, and I desire to so bring them up—one of them especially—that some day they may be fit to enter your association, and if possible, to take the place of the president or the secretary. The public, or commercial reason is this: we have here representatives of European countries: Frenchmen and Belgians. I was very glad to hear these gentlemen say that they had come hither to get up an active trade with Quebec and with Canada in general. I said to myself: since we are brothers in language and in faith, why should we not also be brothers in commerce. It is with this view that I wish, as the spokesman of a man very deeply engaged in the cheese and butter trade, to put a few questions to these gentlemen. These questions were dictated to me by a dealer in cheese who acts for some 50 factories in the province of Quebec, in the Three Rivers district, comprising the parishes of Nicolet, Baie-du-Febvre, &c. The makers in these factories cannot be present here, as the rivers St. Francis and Yamaska are beginning to be frozen over. Allow me to put these questions in their stead.

The first question I wish to put to the commercial agent, who is anxious to establish relations between Canada and Belgium, is: What difference is there in price between white and coloured cheese in the Belgian market?

M. HERREBOUD—cheese must not be coloured exteriorly, to the quality. White Canadian. But not tell you no which time alone

M. MOREAU—export are: do you

M. HERREBOUD—dealings with you and for this reason cheese into the trade must be more of by selling this cheese the pound, not until the whole of all foreign cheese

So, then, you and the grocers, sell every description by sending small quantities of your cheese, rid of one of the large ones. But, them, not because would be of selling

M. MOREAU—be better than those

M. HERREBOUD

M. MOREAU—boxes; would it not storage on board ship

M. HERREBOUD—handy for cutting, advantage to be derived question of freights present. Here are matter in what shape the ship-owner to concern us.

M. MOREAU—A month, or every two

M. HERREBOUD—ment, you will not

(1) *Cheshire*, the county

M. HERREBOUDT.—Coloured cheese we can pass off as Cheshire (1); white cheese must necessarily be sold as Canadian. For the ignorant public, the coloured cheese will fetch a higher price, because of its greater resemblance, exteriorly, to Cheshire cheese, which in Belgium is held to be all of the best quality. White cheese must be sold as an at present unknown kind, *i. e.*, Canadian. But hereafter, when our people have gained in experience, I cannot tell you now which of the two kinds will be preferred; it is a problem which time alone can solve.

M. MOREAU.—I suppose you know how large our cheeses intended for export are: do you think they are big enough?

M. HERREBOUDT.—I may say in reply, that at the commencement of our dealings with you, it would be better if the size of the cheeses were diminished; and for this reason: it is a question of the introduction of a new kind of cheese into the trade. To induce wholesale merchants to buy your goods, they must be more or less sure of their being saleable at retail. They must begin by selling this cheese to the retailer, who is accustomed to sell the cheese by the pound, not by the whole cheese. He must retail it out thus in his shop until the whole cheese is sold. At present, Dutch cheese is the most popular of all foreign cheese. It is round in shape, and about 3 or 4 pounds in weight.

So, then, you must make your goods such as will please the retail buyer, and the grocers. With us, there are retailers who only retail cheese, but who sell every description of cheese known to commerce. You must begin, then, by sending small cheeses. In a year, when our people have learned to appreciate your cheese, and the retailers have found that they are sure of getting rid of one of the large cheeses within a week, it will be to their interest to order large ones. But, at present, the size of the large cheeses would be against them, not because of their inferior quality, but because of the difficulty there would be of selling them quickly enough after being cut.

M. MOREAU.—You think that cheeses weighing 2, 5 or 10 pounds would be better than those of 60 or 65 lbs?

M. HERREBOUDT.—Certainly I do.

M. MOREAU.—Up to now, our export cheese has been packed in round boxes; would it not be better to pack it in square boxes, to facilitate their storage on board ship?

M. HERREBOUDT.—I think not. That shape of cheese is accepted; it is handy for cutting up for retailing; people are accustomed to it. As for the advantage to be derived from sending cheese in large packages, it is simply a question of freightage. I have told you at what price cheese can be sent at present. Here are the rates they have given me: 2,240 lbs. of cheese, no matter in what shape, can be sent for 22s. 6d. Therefore, whether it may suit the ship-owner to carry it in one form better than in another, does not concern us.

M. MOREAU.—Are we to send our cheese to market every fortnight, every month, or every two months?

M. HERREBOUDT.—As soon as you shall have ceased to send on consignment, you will no longer send your cheese to market, but you will arrange

(1) *Cheshire*, the county; *Chester* the town. The cheese is Cheshire, not Chester. A.R.J.F.

matters in accordance with the orders of your purchasers, of the firm I represent, who will ask you, at such or such a time, for such and such a quantity of cheese. The price will have been agreed upon before hand, and will be in conformity with the time of delivery.

At present, it is very different. You deliver and send on consignment; therefore, it is the interest of the dealer to make the price rise or fall, by an operation on the market (*jeu de bourse*), in accordance with the quantity of cheese that arrives at any one time. It will be then we who shall tell you: about such a time, send us such a quantity of cheese. So that the question entirely depends on our future relations.

M. MOREAU—Can you tell us at what season of the year our cheese will have the best chance on the Belgian market.

M. HERREBOUDT—The price will be always the same. Butter, however, is another thing: butter we buy for re-exportation; while cheese we buy for the local Belgian market; and when once it is found that Canadian cheese is worth so much, it will always fetch it—just as Dutch cheese, except in unusual cases, always sells for the same price.

I must mention this: the import duty on cheese is, I believe, 10 francs the 100 kilos; (1) but as I observed before, that is the business not of the seller but of the buyer. You will, then, not have to trouble yourselves about the difference of the market. If you should succeed in placing your cheese on the English market at a higher price than we have agreed upon for one season, we shall be obliged to stand by the increase (*majorations*.) But it will be the English, not the Belgian market that will indicate the prices.

MR. FISHER—I believe that in Holland they make cheese all the year round; here, it is only made in summer. A great deal is made here in summer; none at all in winter. This, perhaps, will make a great difference between the trade with Holland and the trade with Canada?

M. HERREBOUDT—Not at all; you will send your cheese in summer. Your cheese is packed in an utterly different shape from the Dutch: that is made up into little round balls, covered with a coat of paint. Yours are packed in good shape, and you will send them to us at the fittest time of year.

MR. FISHER—When our cheese is finished, will it be at once ready for the Belgian market, without any further preparation?

M. HERREBOUDT—Yes.

MR. FISHER—In winter, the cheese will be riper; that might make a difference?

M. HERREBOUDT—As to that, gentlemen, I repeat that this is an experiment we are about to make. We don't promise to buy anything you make in the shape of cheese. It is the introduction of a new style of cheese, and as soon as you can compete with the Dutch, yours will sell fast enough. Holland does not make as much cheese as it could sell if it had it. Moreover, there is in Belgium a partiality for Cheshire cheese, and, perhaps, a similar partiality may arise for Canadian.

(1) 1000 kilos=2,204 lbs. avoirdupois; 36 lbs. less than an English ton.

M. MOREAU
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M. HERREBOUDT—Your
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M. MOREAU
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M. HERREBOUDT—(filière), by dep
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M. MOREAU—A
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to buy our cheese.

M. MOREAU — Are the round balls you mention a "trade-mark;" and would a trade-mark on our cheese have a favourable or unfavourable effect in Belgium?

M. HERREBOUDT—Your trade-mark is the linen wrapper all round your cheeses, yours is the only cheese I know of that comes to us in that condition.

M. MOREAU—Would not a trade-mark be useful to us, to distinguish good Canadian cheese from bad, from trash?

M. HERREBOUDT—If you like to follow the administrative routine (*filière*), by depositing your trade-mark at the Tribunal of Commerce at Brussels, nobody dare imitate it, or, in case of infraction of the law, without exposing himself to prosecution for pirating it. If you have not fulfilled these formalities, everybody is at liberty, in Belgium, to sell cheese made in the same shape, and bearing the same trade-mark as your Canadian cheese.

But, I assure you, that in making an experiment like the one we are about to try, the question of trade-marks is of no importance. I am going to do my best to make Canadian cheese appreciated at its proper value by the Belgian public, by the Belgian scientific corps, by the Belgian market. And when I shall have informed you how it is appreciated on the Belgian market, it will be for you to judge whether it will be to your advantage to choose a trade-mark, and to lodge it with the Belgian authorities; you will then have all the guarantees that the most advanced legislation can give you. Although Belgium is a country enjoying the most extensive liberties, trade-marks are protected there in the strictest manner.

M. MOREAU—Allow me to make a remark about this trade-mark. I was told by a dealer largely interested in cheese, and who had registered several cheese-factories under the name of "Blue Star," that he had always obtained a high price on the market, because, as he said, his cheese was known, and he was responsible for its quality. Since we can make refined, delicate, super-excellent cheese, I do not see why we should not lay claim to our goods on the foreign markets, or why we should not choose a trade-mark, that we might send out our cheese in our own personal names.

M. HERREBOUDT—Nothing is easier: make out a description of your trade-mark and send it to the Minister of the Interior in Belgium, you will have to pay a trifling fee, and your trade-mark will be inserted in "Le Moniteur." This mark consists of a description of the exterior of your cheese. It is not a "patent right" you get. Any one in Belgium may make a cheese which he may call a Canadian cheese; but he may not give it the shape and trade-mark deposited with the minister.

Send, then, to that country a collective trade-mark, the mark of the syndicate or of the association, and none others than its members will have the right, in Belgium, or in countries having commercial relations with Belgium, to sell goods under that mark. Should any one dare to sell goods stamped with the trade-mark thus deposited, you will have the right to seize such goods wherever they shall be found.

M. MOREAU—Another question: it being understood that the Belgian market is open to us, shall we be obliged to take our cheese to the market at Montreal or elsewhere, or will Belgian brokers or buyers come to our parishes to buy our cheese.

M. HERREBOUDT—As soon as a contract is signed between a factory, or a syndicate of factories with a Belgian house or firm, that house or firm will send hither, at its own expense, to the very factories themselves, its inspectors who will accept the goods at the port fixed upon. Thus, Canada will have the responsibility of manufacturing the goods and of their carriage to the port of shipment; and it is there that the financial arrangements for the settlement of the accounts will be concluded. All will be done through a bank. You will know neither the firm nor the private Belgians who buy your goods; all you know will be their banking account in Canada; and in the same way, those gentlemen will not know the makers who sell the goods, but only their agents, who deliver the goods at the port of shipment. It was in these terms that I, in a pamphlet, explained the situation, more than a year ago; and I am now reproducing that essay in "La Presse."

All the accounts I have been giving you are of projects for the future; according to the results I obtain with the samples I take with me, I shall return after three months, with definite propositions, and then, I trust, the questions put to me will receive their practical replies.

M. MOREAU—Supposing the trade is open to us, do you pledge yourself to compete with the English middlemen?

M. HERREBOUDT—Certainly.

M. MOREAU—This afternoon, I asked some questions about the silo and ensilage; I should like to ask some more, and I beg Mr. Fisher to answer them. If I insist so much on these points about the silo, it is because it is a novelty with us. Many of our farmers do not know what a silo is, or how it is built. Mr. Fisher told us we could built it of wood, but as Monsignor Labelle said that he intended to pave the floor of his silo with brick, I would ask if it would not be practicable to make the whole silo of brick or stone?

MR. FISHER—According to general experience, my own included, I find siloes of wood even superior to those of stone or brick; and the reason of this superiority is, that the external cold, the air-currents, penetrate brick and stone walls more easy than wooden walls. In consequence of the fermentation that takes place inside the silo, and the cold that reigns outside it, draughts are caused that penetrate more easily through the brick or stone walls than through wooden partitions (*walls*). Besides, wood-built siloes are cheaper than brick or stone.

M. MOREAU—Will you tell us, please, what thickness the walls of a wood-silo should be?

MR. FISHER—If you make your silo in the barn, you should make it two boards thick, with a layer of tarred-paper between the two ranks of boards.

M. MOREAU—You said this afternoon, that the silo might be sunk three feet in the ground; on what soil should the silo be placed if it is sunk in the ground; on a firm or on a shifting soil; and should it be drained?

MR. FISHER—The soil should be firm to support the silage without giving. If the bottom is sand, a shifting soil, a floor must be laid. If the soil is firm enough, no floor is required.

You must drain the land, if you sink your silo. No water must be allowed to get into it. Sometimes, the soil may be naturally dry enough; if

not, a small ditch it. The earth in

M. MOREAU—duce of the farm

MR. FISHER—One of the great winter. The hay dry foods; ensilage for that purpose. straw before giving and give them to time the mixture

M. MOREAU—silage?

MR. FISHER—and of hay and straw mix enough to give to say, about 40 lbs day's ration.

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MR. FISHER—prices. You can to make.

It is thorough instance: you put in before adding any chaff the maize, and them, than to ensile the silage keeps much hold much more than given you as to the maize. If the maize fourth bigger, if you

I am asked the bably the best that into the silo. This livered; but with it minutes. It works w The majority of farm that costs about \$50

M. MOREAU—Is

MR. FISHER—I t here is a piece of advice able you to avoid the neighbourhood, join t

not, a small ditch must be dug all round it, to prevent water from entering it. The earth in the silo must be perfectly dry.

M. MOREAU—When the silo is once at work, may we mix the other produce of the farm, such as straw, roots, etc., with the silage?

MR. FISHER—I think the best plan is to mix the silage with dry fodder. One of the great advantages of ensilage is that it gives us succulent food in winter. The hay and straw we usually give our stock in winter are utterly dry foods; ensilage complements them, and is the cheapest thing we can grow for that purpose. For my part, I always mix the silage with chaffed hay and straw before giving it to my cattle; I mix them together in the morning, say, and give them to the stock in the evening or the next morning. In the meantime the mixture ferments a little, and is all the better for it.

M. MOREAU—In what proportion do you mix the dry straw and the silage?

MR. FISHER—That depends on the relative quantities I have of silage and of hay and straw. If I have plenty of silage, enough for all my stock, I mix enough to give my cows twice of silage to once of dry fodder; that is to say, about 40 lbs. of silage and 7 lbs. or 8 lbs. of hay or straw for their day's ration.

M. MOREAU—They tell us there is a machine for chaffing the maize and carrying it up into the silo at the same time. What is its price?

MR. FISHER—There are several sorts; of different sizes, and at different prices. You can choose the one to suit the quantity of silage you mean to make.

It is thoroughly settled that the silo need not be filled all at once. For instance: you put in 5 or 10 tons to-day, and leave it to settle till to-morrow, before adding any more. For my part, I find it much more economical to chaff the maize, and even the clover and other forage-plants, before ensiling them, than to ensile the plants at their full length. There is this advantage: the silage keeps much better chaffed; and, besides, when chaffed, the silo will hold much more than when it is filled with long stuff. The figures I have given you as to the quantity of silage you can put into a silo, apply to chaffed maize. If the maize is put in unchaffed, you will have to make your silo one-fourth bigger, if you wish it to hold the same quantity.

I am asked the price of these machines: I have an excellent one; probably the best that is made. I bought it two years ago; it carries the maize into the silo. This machine, with the elevator attached, cost me \$90 delivered; but with it, I can cut and elevate into the silo a ton of maize in five minutes. It works with a two-horse power, and two men to feed in the maize. The majority of farmers do not need such a powerful machine. I think one that costs about \$50 would be large enough for most farmers.

M. MOREAU—Is that the lowest priced one?

MR. FISHER—I think so; if, that is, a really good machine is wanted. But here is a piece of advice I am going to give you, and which will, in some degree, enable you to avoid the difficulty: let several proprietors of siloes, in the same neighbourhood, join together and buy themselves a chaff-cutter and a horse-

power. Ten or twelve neighbours could thus use the same machine during the ensiling-month, and they would have an opportunity of helping one another.

M. MOREAU—Can you say between what dates in the fall the silo can be filled?

MR. FISHER—The work of filling the silo must be begun as soon as the crop is sufficiently advanced. I do not know how it may be here, but, at my place, we can begin on the first of September, or even in the last week in August, and keep on ensiling until the heavy frosts make their appearance. For my part, I prefer that my silage be not at all touched by the frost. Still, on one occasion I had my corn very much frozen, and that year my silage was almost as good as usual. It is no very great injury, if the corn be a little touched; still, I prefer it unfrozen. Thus, there will be three or four weeks, a month, in which you may keep on ensiling the crop.

I am entirely of the opinion M. Beaubien expressed last night. I think the silo will turn out to be a revelation for our farmers in the Province of Quebec. Now that we can no longer make a profit out of grain and butchers' cattle, we must keep milch-cows, and to help us on in this line, there is nothing superior to silage.

I was asked up to what degree of heat one could let the fermentation of the ensilage in the silo go. This question has been often discussed, and, perhaps is not yet settled; but we have found out that *sweet* silage is much to be preferred to very acid silage; and in order to make this sweet silage, this is what I do: in filling the silo, I let the chaffed maize fall from the elevator without tramping it at all till the next day. I begin by putting in 20 or 25 tons a day, for my silo is rather large. It would be better to put the maize loose into the silo up to a height of about 4 feet. The next day you will find the temperature of the silage to be about 130° F, or 140° F; I have even found it 150° F., and I do not think it was the worse for it. Still, as a general rule, the heat ought not to exceed 125° F. You then tramp the silage down tight before putting any more in. This pressure stops, or rather, checks the fermentation, for it does not entirely arrest it. The silage then remains always sweet. Continue in this way of filling by layers of about three feet, and let each layer heat, as I have just said.

Ensilage treated in this way is much sweeter than if it had been tramped as soon as it was put into the silo; in which case the fermentation would probably continue at work all through the winter.

REMARKS BY M. L. P. P. CARDIN, M. P. P.

N.B.—We regret not having been able to obtain the manuscript of the remarks written by M. Cardin, and, in consequence, we can only publish the notes of the stenographer.—THE SECRETARY.

I am now, gentlemen, going to throw aside this paper, and tell you what I feel without any preparation. I may forget among names of the clergy those who have contributed, and still continue to contribute to the develop-

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THE PRESIDENT
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ment of agriculture as well as to everything connected with it in the province of Quebec. I beg for pardon from all those of whom I do not make particular mention, but, at the risk of wounding his humility, I must speak especially of that curé, that missionary, who has contributed to the establishment of at least 20 parishes in the Northern districts, at St. Jérôme, and even further.

I have had the pleasure of meeting some of the colonists who were poor enough when they went into those parts; having nothing but a few sous, and the tools most needed in clearing up the land. What did they tell me, and what did I ascertain for myself? I ascertained that these poor colonists, who had left home with nothing but an axe and a few tools for clearing a farm out of the bush, possessed, in a few years, property worth a thousand dollars! Well, gentlemen, there are still, in the Province of Quebec, farms to be cleared, and plenty of muscular arms fitted to go and clear those farms, and extract from the land that wealth which the Province of Québec possesses in its soil.

I seem to be intending to make you a political speech: no; the few remarks that I am making spring from a heart anxious to inspire the sentiments with which I am animated into the hearts of all good Canadians, to invite them to avail themselves of the soil's gifts, which only need arms to exploit them, rather than to wander in search of fortune into a foreign country.

Ah, gentlemen, let me beg all those, without exception, who feel within them an inclination for agriculture and all the industries that are allied to it, to set to work to clear those virgin forests that only ask for men to convert them into farms.

You know that, with a view to the encouragement of colonisation, there was a law passed last session granting to every father of a family, or poor widow, who has 12 children, 100 *arpents* of land. Well, gentlemen, you understood the object of this law as well as we, the members did; you understood that this law was to favour colonisation; that there were still farms to be cleared and cultivated, and that the children who were growing up under the guidance of their fathers would, in the coming years, themselves be in need of farms. The Government, then, in its wisdom, granted to those whom Providence has blessed, a patrimonial estate on which to rear their offspring.

Gentlemen, all this seems to have but indirect reference to the subject of this evening's meeting: but, in truth it lies at the very foundation of this agricultural industry. Well, let us profit by it. Let those who are happy enough to be the progenitors of twelve children profit by this new law, and establish their children on those lands that need bringing under cultivation. Let us grow strong and multiply: by these means a goodly number of parishes can be formed, and we shall find a way to extract from the soil all the profit that hearty farmers can make it yield.

Gentlemen, I will not abuse your kindness; I have been rather long, but I said that I was conscious of imperfect utterance, for my sentiments are better than my manner of expressing them.

THE PRESIDENT—I beg to thank M. Cardin for the kind things he has said of me a propos of the disinterestedness I seem to have shown in causing the convention to be held here. I yielded to his request; I did it with a good grace; I was the first to do so, and now I am glad I did it: the association would

perhaps not have been received elsewhere with such sympathy, such magnificent treatment, as we have received at Sorel.

THANKS TO THE CITIZENS OF SOREL.

M. BERNATCHEZ.

I am sorry to have to announce that the convention must now be adjourned. It is already late, and some of your visitors are obliged to leave this evening. There only remains a very short time in which to perform a task which to me is a very agreeable one. Only, I may perhaps, not be able to discharge this duty in the terms suitable to it.

I have to thank you, gentlemen; that is all that remains to be done. This evening, the Board of Directors passed a resolution, which was not *motivée*, (put as a *motion*), but will be published, thanking the mayor, the authorities, and all the citizens, for the very kind manner in which we have been received here.

You will allow me to add something to this resolution. In the name of this entire association, I thank you, Mr. Mayor, for the kind, sympathetic, courteous, and splendid reception you have accorded us. We have felt ourselves highly honoured by the manner in which you have received us. The mayor and all the dignitaries of the town united with the people of the surrounding country at the opening of this convention. It was magnificent; it was done in a most superb manner; I offer you our sincere thanks, and the most heartfelt gratitude for all that has been done for us on this occasion.

I shall be permitted to say something as regards the mayor in his own proper person. He received us at his house, personally, with so much distinction, that I may safely thank him, publicly, as well as all the citizens who have done the same on other occasions.

I also offer our particular thanks to Monsieur le curé of the town and the members of the clergy, who were good enough to be present at this meeting, enhancing thereby the brilliancy of this convention, and giving it a stamp of dignity that greatly honours us. Their presence is always an honour, and I will profit by this occasion to beg them to use their influence with those with whom they have to do, to endeavour to lessen the number of those frauds, even if they cannot put an end to them altogether, that are committed by those who take milk to the factories. I think, that by speaking of it from time to time, they would make the patrons reflect, and prevent the continuance of this fraudulent system.

A word may be permitted me, I hope, a word of thanks to our colleague of the board of direction, Dr. Bruneau. He has shown so much zeal and devotion; he has taken so much trouble upon himself, that I trust this special mention of him will wound no one's susceptibilities.

I must also thank all our skilful lecturers for their essays and reports. I will not mention any one in particular, for all have displayed a knowledge

of their subjects to my cordial thank meeting, and these have asked questions the details of the i

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Gentlemen, I leave tion, which the board o

of their subjects that will, I hope prove profitable to their hearers. I offer them my cordial thanks for their essays, and for the ideas they have laid before the meeting, and these I trust will bear good fruit in the future. Those, too, who have asked questions merit my thanks. It is by means of these questions that the details of the information possessed by men of science are drawn out.

All those who have honoured this convention by their presence I request to accept my thanks. The audience has always been numerous. It was a fine sight for us, and a real pleasure, to see that the convention attracted hither a large and intelligent crowd, who listened to the discussions and essays with note-worthy attention.

I thank, too, the ladies who honoured us with their presence.

The press of Sorel I also thank. I observed that the papers invited those ladies to be present, and some of them accepted the invitation, which honoured us greatly. The press deserves our congratulations, not only on that account, but by reason of the reports given in the papers.

We were enchanted at the reception you gave us, and we were enchanted with your beautiful little town. It is the first time, I, for my part, ever visited Sorel; I have heard it spoken of, but I had no exact idea what it was like. Your little town is so well laid out, that its equal is rarely to be seen. Nowadays, it contains manufactures of the greatest consequence. The mayor took us to see these grand establishments, at noon, and I was surprised, gentlemen, at the sight of the amount of employment these manufactures give here, and delighted was I with that lovely river, the Richelieu.

There is no doubt that as things are going, your town will continue to prosper. That it may do so is a wish I beg to express for its future in the name of the association.

Here, in the presence of the meeting, you will allow me to offer my thanks to our secretary, M. Taché. The real director of the association may be said in two words to be—Monsieur Taché. It is not secretary alone that he is, he it is that controls the whole movement. I am pretty well acquainted with the sacrifices one is obliged to make in establishing manufactures and keeping them going, with the competition one meets with at every step. Several people have made this remark, and a very judicious one it is. M. Taché has made sacrifices in order to make this dairy-industry as prosperous as possible. I do not think I shall wound any one's feelings by offering him, this evening, the thanks and the expression of heartfelt gratitude we feel to be his due.

As I said at starting, I regret not to be able to close this convention with more appropriate words; but, after all, you must accept whatever kind of a president the association chooses to select. I beg you to pardon the unskilful manner in which I have expressed myself, for, gentlemen, the power of expression is often wanting to the full heart. Had I the advantage of possessing the power to say all I feel, my address would be much better worth listening to.

You understand my position: I am not a man of letters; but still, I have some courage. I have done my best to make myself of use to the association that has chosen me for its president.

Gentlemen, I leave you with regret, and I trust that, in the next convention, which the board of directors settled this evening is to be held next year,

at Montmagny, I shall meet you all if possible, but, at all events the greater number of you.

Thanks, once more, for all you have done for us; pray believe that we shall ever remember it with feelings of gratitude that will never be effaced from our hearts.

ADDRESS OF THE MAYOR OF SOREL.

Mr. President and Gentlemen.

I do not possess eloquence enough to reply promptly to the courteous compliments that the president has been pleased to address to me and to the councillors; but I feel deeply the manner in which you have spoken of the reception we had the pleasure to offer you, and I am greatly pleased to hear you express your satisfaction at it.

When we were trying to induce you to hold your meeting here, and were endeavouring to tempt you to visit Sorel, I will frankly confess we had two objects in view: First, we desired the pleasure and advantage of making your acquaintance; secondly, we were prompted by interested motives. We wanted to make use of you. We wished our town to become known to strangers of distinction; to display to them the advantages we have to offer to trade and manufactures. We wished to make our town known to persons of distinction, in order to afford you an opportunity of speaking of it abroad, if not in flattering terms, at least without saying much against it. We were aware that the credit and influence you enjoy, in the country at large as well as in your several localities, might be of service to us, and we wished, as I said before, to exploit them.

I reckon then, Mr. President and Members of the Association, upon your finding an opportunity of saying all the good you can of Sorel; you will, if you justly can, extol our commercial capabilities, our agricultural and manufacturing resources; and you are at liberty, if your hearts prompt you thereto, to speak of the ambition of the Mayor of Sorel, whose ruling passion is to cause the influx into the town of as much capital as possible, in order to make of Sorel a centre able to cope with the largest towns of the province.

If we wished the Sorel meeting to be successful, our wishes have been certainly amply realised. And you have been yourselves the cause of this success, by your spirit of association, by the dignified manner in which your president has presided over your sittings, and by those brilliant discussions that bore the stamp of wisdom and of a profound acquaintance with the subjects you have treated. I do not speak of those remarks that they who came hither made with regard to the instruction you have given, and which you will leave behind with our people. When, yesterday, I was addressing you for the first time, I spoke to you of the different elements that compose the riches of nations, and I said that I considered agriculture as one of the most important of them. And indeed, it forms the very basis of our national prosperity. But agriculture itself, possesses a variety, a diversity of elements, each of which requires separate exploitation. Here, the dairy-industry has been expounded to the

public, to those who yourselves.

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I thank you, Mr. I accept the merit attribut I consider that on this the town of Sorel has with important offices, my influence and all Thus, gentlemen of Sorel gratitude, and I am ve

public, to those who would understand it, by such distinguished agronomes as yourselves.

Between the elements that go to form agriculture and agriculture itself, which is one of the elements of the national wealth, of which it is one of the great tributaries, there is a perfect connection. As small brooks make large rivers, so, the relations between agriculture and trade produce wealth, and they are so many little brooks that, while fertilising the district they traverse, carry their tribute to the great river that, in its turn, fertilises the whole territory. From the few words I have said, it follows that associations, like yours, imparting an impulse to every branch of agriculture, will diffuse everywhere a taste for good farming, will instruct the people; and the agricultural population, I believe, will warmly appreciate the advantages you have given them.

As, since the construction of the transcontinental railroad, we hear the roar of the two oceans it unites, so, before long, I hope, will be heard the sound of the plough, boring its way across the vast domain from the Pacific to the Atlantic, that enormous territory, the finest, the most fertile in the world, to which we shall one day hear given the title of the *Granary of the Universe*. By that means, we shall succeed in making of Canada what it ought to be: a prosperous country, the centre of commerce and of agriculture.

I know that much energy is needed to enable us to realise these our legitimate aspirations; our vigour and enterprise must be redoubled. If we are content to live on hope, and to lull our hopes to slumber in the sun, we shall remain in the back ground; a consummation hardly to be wished.

I desire to express to you once more my gratitude, Mr. President. You have mentioned the name of Dr. Bruneau, and I beg to thank you both: the one for having accepted our invitation, the other for having conceived the happy idea of bringing this association to Sorel for its convention of this year. I thank you in the name of the council and in the name of my fellow-citizens, and I profit by this opportunity to thank you in the name of the farmers of the neighbourhood, who have come hither, yesterday and to-day, to listen to your discussions. I beg to express to you my personal good wishes; for you, Mr. President, for your families, and for the grand association you so worthily represent.

ADDRESS OF DOCTOR BRUNEAU.

If the mayor had not added his quota to the compliments Mr. President paid me, I certainly should not have risen, but I find the measure is full and running over.

I thank you, Mr. President, as well as you, Mr. Mayor; but I by no means accept the merit attributed to me. There is a saying: *noblesse oblige*. Now, I consider that on this occasion I have only done my duty. In the first place, the town of Sorel has so often shown its confidence in me, by honouring me with important offices, that I felt that I was bound in gratitude to exercise all my influence and all my energies, to render her what I felt to be a service. Thus, gentlemen of Sorel, you owe me no thanks: I have paid you a debt of gratitude, and I am very glad to have been able to do so.

And now, I assert that neither the Dairymen's Association nor the president and directors, owe me any thanks; and I think that the favour they did me last year, by accepting the invitation I was commissioned to present to them, by accepting me as the go-between, and by accepting the invitation of the mayor, the authorities, and the inhabitants of the town, assisted by M. Cardin, among others; I think, I say, the favour they have done me by coming to Sorel, was to me a sufficient inducement to devote myself, body and soul, to the success of the convention and to their material prosperity.

I hope we have been successful; anyhow I thank you all together for the kind words you have addressed to me; I assure you I feel them very deeply.

[The following text is extremely faint and largely illegible, appearing to be a continuation of the letter or a separate document.]

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SUPPLEMENT

TO THE REPORT OF THE CONVENTION.

NOTE.—All the essays that follow were to have been read at the meeting ; but the glut of matters to be treated obliged us to leave them on the table.

It was decided at a meeting of the Board of Directors, not to publish in our report the essays that were not read at the convention, without this previous mention of the fact.

REPORT OF INSPECTOR COTÉ.

TO THE HON. HONORÉ MERCIER, PRIME MINISTER, AND COMMISSIONER OF AGRICULTURE AND COLONISATION, QUEBEC.

Sir,

I have the honour to report to you, that, in my quality of inspector of cheese and butter factories, I, as usual, have gone over the territory extending, on the north shore of the St Lawrence, from Three Rivers to Chicoutimi, and on the south shore, from Bellechasse to Athabaska.

I visited 174 factories : 146 of cheese, and 28 of butter.

The increase in the number of factories in my district, in 1890, is 20 cheese and 8 butter factories. The amount produced in this year in the district was, approximately, 3,444,500 lbs. of cheese, and 517,716 lbs. of butter. I say, approximately, because the absence of proper accounts at a host of factories hindered us from getting, this year, at the exact quantities of butter and cheese made last year, so as to furnish them to the department, from which we had received orders to collect these statistics, with a view to enable the proper persons to show that the Province of Quebec produces much more butter and cheese than certain people are pleased to admit. As it may be asserted that our figures are exaggerated, seeing that we have not been able, as I said, to get positive information, I declare at once, that, for my part, I have made my calculations as near the truth as possible, by ascertaining, as well as I could, the quantities of milk received last year at those factories whose book-keeping was not carried out in a proper manner.

I regret to be obliged, if I am to speak with sincerity, to confess that we are improving much faster as regards the quantity than the quality of our dairy products. Not to repeat what I said in my report last year—as much to the proprietors and their makers as to the patrons of the factories—I would ask you to observe that the faults that I have again pointed out this year, spring from the same causes as in past years. As long as there is not a better understanding between the proprietors, the patrons, and the makers in t

establishments as to the amount of duty and responsibility incumbent on each of them respectively; that is, on the patron, to deliver the greatest quantity possible of fine, wholesome milk; on the proprietor, to supply the materials and buildings proper for the production of good articles, and for their fitting preservation; and on the makers, for the greatest and most minute attention to all the details of the work they have to do; as long, I say, as these conditions are not fulfilled, so long shall we remain so far from perfection that we shall have reason to fear that other countries, more progressive than ours as regards dairying, will deprive us of the principal market we have—the English market—and by this take from us one of our chief sources of revenue and, I will say, the chief source of the agricultural prosperity of the Province of Quebec.

If, sir, such a misfortune should happen to us, to whom should we attribute the fault except to ourselves, through our want of energy to correct our imperfections, our faults. Still, I do not think we ought to feel discouraged. What is to be done? We must apply the necessary remedy to our ills, and they will soon be cured.

I know, sir, that one of these remedies was suggested to your government last winter by the executive of the Dairymen's Association of this province. This committee addressed Colonel Rhodes, then Commissioner of Agriculture, with a view of asking for the amount necessary to aid the patrons of butter and cheese factories to form syndicates; the government paying half the salary of an inspector entrusted with the duty of looking after each of the factories under the control of the said syndicates; these syndicates consisting of not less than ten and not more than thirty factories; the other half of the inspector's salary to be paid by the parties interested. Well, sir, this would be an excellent way for us to correct the defects which we have pointed out in the management of the factories; and allow me to join with the delegation which addressed your predecessor last year, and to tell you frankly, that the money expended in this way could not be better employed. The fact of having a competent man to visit our factories, every week or fortnight, and to repeat unweariedly everything there is to be done in every factory to make its products, if not perfect, at least fairly so; this fact, I say, would have, in my opinion, a splendid effect: it is by constant hammering that the nail is driven in.

Besides, sir, your government so well understood the case, that it placed \$1,200 at the disposition of such factory proprietors as desired to form themselves into such syndicates during the dairy season that has just closed. But the decision having been come to a little late, it was impossible to meet and impress in time all those interested with the importance of the benefits to be derived from the formation of these syndicates. To my knowledge, there is only one of them formed. This one has given very good results, which shows us all the good we have a right to expect from associations of this kind, if your government think fit, as we hope it will, to patronise them.

Another way, to which I beg to call your attention, to assist our dairy-industry is that which I suggested in a letter to Col. Rhodes on the 20th March last. In this, I pointed out the advantage of having some one practically informed on the dairy-industry permanently attached to the Department

of Agriculture, a letter or person a serious difficulty some one of experience considerable losses, and patrons of the expression that our

Even admit cates, it must be always be many from being too 1 which these estal those factories th services of the en those which are addition to the d which are enumer take care, on the 1 ditions required to in any direction.

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Last summer, of July, had some only brought him 4 cents. As he had a \$240, a loss that he some one to teach hi of this, I may say th to advise the maker,

of Agriculture, and bound to reply immediately to all questions, whether by letter or personally, sent in by those butter or cheese-makers, who meet with serious difficulties they are not able to get over without the instructions of some one of experience; and who will meet with, and do meet with, very considerable losses, both on their own part, as well as on the part of the proprietors and patrons of the establishments they conduct, without reckoning the depression that our dairy-goods suffer in consequence.

Even admitting all the good to be derived from the formation of syndicates, it must be expected that, in several places in the province, there will always be many factories which cannot form part of these associations; either from being too far from one another, or from other unavoidable causes, by which these establishments will be deprived of the advantages possessed by those factories that are more favoured by their situation; then, through the services of the employé in question, these factories can be kept on a level with those which are under the control of a syndicate. Besides, this employé, in addition to the duties which, in my opinion, he should have to perform, and which are enumerated more at length in my before quoted letter, might also take care, on the part of the government, that the syndicates fulfilled the conditions required to obtain the subsidy in question, and that no fraud took place in any direction.

Again, this special employé might, as I mentioned in my letter of the 20th March, be occupied in winter with the instruction of those who intend to devote themselves, in one way or another, to the dairy-industry, and be instructed to deliver lectures on the subject whenever required.

If I take the liberty of submitting for your consideration the ideas I have just enounced, it is because I feel that, in spite of the assistance already granted by the government to our dairy-industry, it is still in need of additional aid. Not to speak of what I know practically, I must say that the present organization of the inspection of creameries and cheese-factories is far from what it ought to be, considering their constantly increasing numbers. There are only two government inspectors, and there is a third under the control of the Dairymen's Association; so that it is impossible that we three can do more than visit hastily the factories situated in the territory assigned to us, which we are obliged to traverse without deviating from the direct road. Thus, we are not allowed to visit any one who wants our help, so long as we do not find his place lying on our traced-out line of visits. And so strict is this rule, that we cannot return to a factory we have previously visited, however great the need of our services may be. In support of what I have just said, I will bring forward two cases that have happened within my knowledge:

Last summer, a cheese-maker, when I was at his place, towards the end of July, had some very bad cheese which he told me later in the season had only brought him 4 cents a pound, when his neighbours' cheese was worth 8 cents. As he had about 6,000 lbs. of it at the time of my visit, the loss was \$240, a loss that he might have avoided had he had the good fortune to have some one to teach him as soon as he found that he was at fault. As a proof of this, I may say that, in spite of the little time I had to spare (about two hours) to advise the maker, he told me that after my visit he made cheese which he

sold for the regular price paid for the good cheese of his neighbours. The other case is that of another cheese-maker who, at the time of my visit, said he had no need of my services, and yet, about a month afterwards, begged that I would return, to help him to overcome certain difficulties he had met with. Well, I could not grant his request, as I had to follow my route, and visit others who, for the most part, had no immediate need of my presence. For, sir, two express conditions are laid upon us by the department we belong to: the first is to visit all the creameries and cheese-factories to be found in the districts assigned to us; and the second is not to expend more than a certain sum for travelling expenses and board; which sum is not sufficient to allow us to work throughout the whole dairy-season; a proof of which is that, this year, I was debarred from working a month before I should have been otherwise obliged to stop, because the funds set apart for the purpose were exhausted. Still it is incumbent upon me to say that, this year, I visited 55 factories more than last year, which has necessitated an increase of expenditure on my part.

I trust, sir, that the few suggestions I have taken upon myself to make in the present report will be favourably received by the government.

The whole respectfully submitted,

SAUL COTÉ,

Inspector of Butter and Cheese Factories.

ST. FLAVIEN, 5th November, 1890.

ON GREEN OR SOILING CROPS.

I fancy most of my hearers have, at one time or other, found, towards the middle of July, that their stock have, more or less suddenly, begun to fall off; the cows in their yield of milk, and the horses and young beasts in the accumulation or the acquisition of flesh. I am not speaking of those pleasant spots that lie along the banks of the vagrant *Coaticook*, or the rockbedded St-Francis, in which blest paradises the grass is rarely wanting, even in the driest seasons; but of those districts in many of which the land, though by no means originally devoid of fertility, has been so thoroughly ruined by bad cultivation and the too frequent repetition of grain crops, that the grass of the pastures, when once eaten down, refuses to spring again, rain it never so abundantly, until the season is so far spent that the production of meat, butter and cheese is cut hopelessly short for the year.

To such an audience as that I am now addressing, it will not be necessary to insist upon the necessity of supplying something to fill up the void created by the failure of the pastures. I presume at least 9-10 of you are in the habit of sowing maize for mowing green for your stock, particularly for your milch-cows, and a very wise plan it is. But, because I think this practice is capable of a greater and a more profitable extension, I have thrown together a few notes—many of them by no means new,—which may perhaps prove interesting to some of you, on the various fodder or green-crops suitable to the land and climate of this country.

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Forage-crops, in this part of the world—I am speaking chiefly of the district east of the city of Quebec,—if cultivated systematically, give very little trouble, cost very little, and are immensely profitable.

They give very little trouble, because, when once sown, they take care of themselves, requiring no hoeing; they cost very little, because all that need be expended in their cultivation is the price of the seed; and they are immensely profitable, because they supply the greatest need of our husbandry; green, moist, wholesome food in the driest time of the year.

The different plants I recommend to be sown for the purpose are the following:

Rye;

Lucerne;

Orchard grass and red-clover (mixed);

Perennial red-clover and perennial ryegrass (mixed);

Hungarian grass;

Sainfoin;

Tares or vetches;

Pease, vetches, oats, corn, and rape (together);

Corn;

Rape or coleseed—for sheep principally.

The first eight for horned stock and horses; the last—rape or coleseed—for sheep.

Rye.—Every farmer should grow a small piece of rye. I should have said two or three small pieces, for this cereal runs through its courses in the spring so rapidly, that a week or at most ten days after it is fit to cut, it is unfit to eat. The land chosen for rye to be mown green may be the cleanest piece of wheat or oat-stubble; a moderate dose of dung, or 200 lbs. of sulphate of ammonia will help the yield immensely; and the land should be prepared as follows:

First, for *fall-rye*; a furrow of ordinary depth, harrowed fine; three bushels of sound rye sown to the *arpent*, and ploughed in $3\frac{1}{2}$ inches deep; the land to be left untouched till the spring. Those who possess a drill may put the seed in with it, at the above depth. Harrow and *roll* in spring.

Spring-rye.—Autumn furrow well laid up at an angle of 45° , $3\frac{1}{2}$ bushels of seed to the *arpent*, well harrowed and *rolled* as a finish.

I am inclined to think that a bushel of wheat substituted for the same quantity of rye in the spring-sowing might be advantageous. Although wheat is a slower grower than rye, it would thicken the bottom-feed and give a heavier cut towards the end of the season. One thing is certain: both cattle and horses prefer green-wheat to barley, rye, or oats.

The quantity of seed I recommend may seem extravagant to some of you; but, take my word for it, if you spare seed for green-crops you will have but poor returns at mowing-time. In my country, we sow four bushels of rye to the imperial acre, and we find it not only yield a greater bulk, but that it comes earlier to the scythe in consequence.

The land devoted to spring rye should be divided into two parts, and sown with an interval of two weeks between the sowings. If the land is in good

heart, an acre of rye ought to provide green-meat for twenty cows for ten days. Too large a feed of this earliest of all green foods is dangerous. It should be allowed to lie and wilt for several hours after mowing, and should be given in the afternoon at first; as, in fact, should all green-meat.

Your horses will feel deeply grateful to you for a bunch of rye in spring. After their long course of dry food, it would cool their system, and although they might have to return to their hay and oats, they would thrive all the better for the change of food, even if it only lasted a week or ten days. The first sign of spring we used to note in London was the sudden irruption of carts loaded with bundles of rye for the *mews* or stables, where large quantities of this food are consumed every season, and I presume the owners of the horses find their account in the practice.

Lucerne.—This most valuable plant is only of local adaptation. It abominates water at its roots, and cannot bear rough treatment. Lucerne will stand any amount of cold, but its frequent failures are due as a rule to an injudicious choice of soil. It is probably the oldest forage-plant known to agriculture, and its plentiful yield, when it meets with proper treatment and a suitable soil, should induce every farmer of light dry land to give it a fair trial. When once established, it is very forward, that is to say, it will be fit for the scythe at least 12 days before red-clover. Should any one feel inclined to sow lucerne in rows, I warn him that he will in all probability soon plough it up again, for land treated in this way can hardly be kept clean by any amount of hoeing: this I say from experience, in spite of the books. But there is a plan which does away with all manual labour during the growth of this crop, and I will try to describe it as plainly and as lucidly as possible.

In the first place, lucerne demands a dry subsoil. Sandy loams, black loams, and clay-loams, will all suit it; but on heavy, tenacious clays, on which water lies in spring and autumn, it would be waste of time and seed to attempt to grow it.

Having chosen a piece of land near the homestead, clean it thoroughly: not a particle of couch-grass, or other rootweeds must be allowed to remain. On this, spread, in autumn, a good dressing of your best dung, which plough down with as deep a furrow as your horses can manage. There is no fear of burying the manure too deep, as the roots of lucerne will penetrate six feet below the soil in their search after food, provided there is no water in the subsoil.

When spring arrives, and the land is fit, sow your barley as usual, and after the land is well—particularly well—harrowed, sow broadcast 20 lbs. of lucerne seed to the acre, and after passing the chain-harrow over the piece, roll it with a good heavy roller. If you have no chain-harrow, a bush-harrow must serve, but the former does such perfect work that every farmer ought to have one.

After the barley is cut and carried, a light dressing of strawy dung will help to protect the young plant of lucerne from the frost. In the spring following, it should be harrowed with light harrows, and rolled again. In the next autumn, when the crop has been mown for the last time, harrow severely with heavier harrows, until the ground is free from weeds, as the roots of the

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plant will by this time have gone down too far into the subsoil to be injured by the harrows.

A plant that yields four crops a year, as this will do, should not be stinted of food; so you will find it pay you to manure it every year with your best dung.

I see Mr. Evans, the well known seedsman of Montreal, quotes the price of lucerne seed at 20 cents a pound.

The above system of growing this valuable forage-plant was the one pursued by my farm tutor, Wm. Rigden, of Hove, near Brighton, England. He never had less than twenty acres of it, and as he had four horses employed all day in drawing dung, and three horses all night in drawing night-soil, from the neighbouring town, he never spared manure.

Lucerne ought to be cut as it is coming into bloom; which, taking an average of years, will be about the end of May in this district. Mr. R. H. Stephens mentions in a letter, dated June 5th, 1879, that "We began cutting lucerne on Monday last May 29th.—It is now two feet to two and a half high, in spite of our having had no rain for four weeks. Last year, we cut it the second time on June 21st. We get four crops in a season. I fed five horses, two bulls, and some calves with it for four months." Unfortunately, Mr. Stephens does not mention how large the piece was.

I have never tried plaster for this crop, but *theoretically* it ought to suit it well.

Don't sow lucerne in the dampest corner of a field in the shade of some trees, as a friend of mine, who ought to have known better, did, and lost his crop; but give it plenty of light and air.

Orchard-grass and red-clover.—In succession to the first cut of lucerne a mixture of two bushels of orchard-grass and 8 lbs. of red-clover will be found useful. The peculiarity of orchard-grass is that it grows in tufts or bunches, and the clover will fill up the gaps and add greatly, besides, to the alimentary value of the crop. This mixture should be sown broadcast with a spring-crop of grain, and rolled in after the last harrowing as described for lucerne.

The best sort of clover to sow for soiling purposes with orchard-grass is the *true cow-grass*, or perennial red-clover: *trifolium pratense perenne*. A piece the Messrs. Dawes of Lachine allowed me to sow on an acre of their land in the spring of 1889, has turned out a most valuable acquisition. From the 12th June this year, 1890, their milch-cows have been daily supplied with this food as their evening meal. Mr. Tuck, their farmer, tells me he would not have known what to do for them without it. The quantity of food produced on this small piece of land exceeds all belief, and there is at this date—October 14th,—a good bite still on the ground. This is, I believe, the first time the *true cow-grass* has been tried in this country. (1) The greatest care should be taken to get it true to sort, as even in England, whence I imported it, it is not easy to buy it pure from admixture. Nothing, except my favorite mixture, to be mentioned hereafter, can exceed this crop of orchard-grass and clover as a food for milch-cows. Mr. Henry Stewart, a well known agronomer, told a friend of mine that, "when changing the food of his cows from orchard-grass

(1) This same piece of perennial clover is just as good this year, 1891. A. R. J. F.

and clover to timothy of good quality, the yield of his cows fell from 25 lbs. to 17 lbs. a week, and no increase of grain-food that could safely be given would restore the loss."

If any of you have good dry-lying land on the hillside, that you would like to lay down with some permanent forage-crop, I advise you to try *sainfoin*. About this plant there is this peculiarity: it takes three years to come to its best, but, in revenge, where the soil suits it, it will last seven or eight years. Immense quantities of this plant are grown on the thin chalk soil of the S. E. of England and the N. W. of France, and a beautiful sight is a field of sainfoin, when ready for the scythe, with its upstanding crimson flowers coloring the whole piece, and visible for miles and miles.

The seed of this plant is sold in two forms: in the husk, or milled. In the former case 4 bushels an acre will be required; of the milled 45 lbs. will be enough, and in both cases great care should be taken that the seed is well covered, as it is apt to dry up after once starting unless the land is pretty moist after sowing. A small piece I sowed last year on the Cross farm at Lachine met with but bad luck, as the water from the melting snow killed part of it; but the roots that escaped came along well in the spring, and the crop was fit to cut for hay June 17th, 1890, ten days before the red-clover alongside of it. (1)

For hay, sainfoin should be cut just as the blossom is beginning to expand, and as it is a very early crop, I recommend that, to increase the first year's yield, a few pounds, say, 6 lbs. to the acre, be sown with it of hop-trefoil, *medicago lupulina*. Both the sainfoin and the trefoil become sticky if allowed to stand too long.

If your sainfoin does not look very gay the first season, do not be discouraged: it will, if the land is clean, pick up wonderfully in the second season, and astonish you when the third summer arrives.

Hungarian grass is another useful soiling crop. It has this immense advantage: it may be sown successfully from the first of May to the first of August. Hence, its utility where any other crop has failed. I know it has stood me in good stead more than once, particularly at St. Hugues, where, on a worn out farm I was seduced into taking, my cows would have been starved had it not been for this quick growing crop. At Sorel, too, in a spot where the grass had failed, I sowed 3 gallons per acre on the 2nd June, and on the 20th August I cut about 2½ tons of hay to the acre. If cut when first in bloom, Hungarian grass makes good hay. I have also sown it at the rate of ½ a peck with 4 lbs. of rape-seed to the acre, on the 20th August, and had a good succulent bite for my cows by October the 1st; but as to this I was very fortunate, as the frost kept off till it was finished—about the 15th of that month—and the cows never went into winter quarters in better condition. On another occasion, the Hungarian grass was cut off by frost on the 15th September. It will stand any amount of heat, but ten degrees of frost is fatal to it.

The only preparation needed for this crop is good cultivation. There is no use trying it on rough land. Plough a fair depth, grub, harrow, and roll, sow 3 gallons broadcast, harrow in with light-harrows, and finish with the roller. The land *must* be made fine, and if you can afford a moderate dressing

[1] In 1891, this sainfoin was very fine and fit to cut June 10th for hay. A. R. J. F.

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of dung, or 200 lbs. of sulphate of ammonia per acre, you may safely calculate on having from ten to twelve tons of green-meat of superior quality to the acre. But it *must* be cut young, or else, like trefoil, it becomes so sticky that the cattle do not care for it.

Tares or vetches.—Of this plant there are two kinds, the one with large seeds, commonly called *spring-tares*, the other, called *winter-tares*, the seeds of which are much smaller. The best farmers of the eastern counties of England however, always sow the smaller seed, as they find the crop it yields much superior in quality.

Tares are, in England, rarely sown alone; rye, oats, or wheat, about $\frac{1}{3}$ of either, is always mixed with them. For sheep, two or three lbs. of rape or coleseed are added to $2\frac{1}{2}$ bushels of tares to the acre, and this forms a succulent repast for ewes and lambs in the early summer. As soon as the tares are fed down by the sheep, or mown for the horses, the land is ploughed at once, and sown with turnips, which, in their turn, are eaten off by sheep, cake or grain, pease or beans, &c., being added, and it is on this succession of sheep-crops that our lighter soils depend for their success in producing almost incredible crops of grain. Tares for stock should always be in bloom before cutting.

But my favourite *soiling-crop* is a mixture composed as follows:

1 bushel of tares;	} Per acre.
1 do " pease;	
1 do " oats;	
$\frac{1}{2}$ do " corn on light lands, of horse-beans on heavy land;	
3 pounds of rape-seed.	

The land should be well prepared and dunged as usual, the grain and pulse broadcasted or drilled in, and after the final stroke of the harrows has been given, the rape should be scattered over the piece, when a rolling will finish the job.

M. Pierre Guèvremont, who is probably present, will tell you, perhaps, how very useful he found this mixture in the hot summer of 1886.

The seed should be buried pretty deep, as otherwise the corn or the horse-beans, as the case may be, will be difficult to cover with the harrows. Should there be no drill on the farm, the best plan would be to put it in with the grubber, or with the sowing machine.

Pray do not be afraid of the quantity of seed. The crop should be cut when the pease are in bloom, by which time the tares will be forward enough to be safe from any danger of scouring the horned-stock or horses. The daily portion of this and of all other soiling-crops must be allowed to wilt before being fed to cattle.

Maize.—So much has been said at previous conventions of this association on the cultivation of this plant, and of the most economical way of consuming it, that I need not expatiate on its value; but one observation I must be pardoned for making: it is my firm belief that one acre of land sown with the above mixture of pease, tares, oats, maize, and rape, will produce as much milk as an acre and a half of green maize. I do not speak of silage corn, when the

nearly ripe ears are cut up and mixed with the stems and leaves, but of maize in the usual condition in which it is given to cows in the month of August.

Rape.—In 1873, Mr. Cochrane, of Hillhurst, sowed 20 acres of rape and cut it when full grown for his cows. He told me it answered well, but I think he would have done better had he given it to his splendid Shropshires. The cultivation of rape is simple enough: make the land clean and fine; give it a fair dressing of dung or bone-dust, unless it follows a previous manured crop like corn or potatoes, in which case it will do without any manure; harrow well, sow from 6 lbs. to 8 lbs. of seed to the acre, and roll it in. Rape grows so thick and so fast that it needs no hoeing; and if the land is evenly covered with seed, not a weed can show its head. At maturity, rape stands about 3½ feet high, and if it be mown close to the ground, should yield from 12 to 15 tons to the acre. It will stand any degree of cold above zero, and I have had it perfectly green on the 7th December, so it is clearly the most hardy of all soiling crops. Still, as I said before, I grudge every bit of it not given to sheep, whose peculiar property it ought to be.

And why all this fuss about soiling crops? well, for this reason: the pastures of this province are not, as a rule, given to produce much food after the first flush of the grass is over; as for feeding the meadows after haying, I suppose every body knows that meadows in which timothy-grass is growing should never be grazed at all. Owing to the bulbous habit of growth of that plant, the roots are easily drawn forth from the ground, and the injury once done can never be repaired. Consequently, towards the fall, the cattle, being restricted to the aforesaid inferior pastures, which by that time are, except in very moist seasons like the past, pretty bare, retire into winter quarters in by no means a proper condition to bear the generally hard fare of straw and a little poor hay they are expected to support life upon till the long season of stabulation comes to an end; the steers and heifers lose flesh, the cows fall off in their milk just when butter fetches the best price in our centres of population, and the poor animals never, during the whole season, recover from the check, but go out to grass the following spring with the double duty of repairing the waste of flesh and fat, and of yielding milk at the same time, imposed upon them.

Now, however, I trust and believe, all this penury is on the eve of changing to a wiser process of management. In future, we shall see the stock of the farm rejoicing in unlimited supplies of succulent food from the silo and root-cellar during the winter months, and, after the first flush of grass has been cropped in June, falling back on a copious provision of well advanced soiling crops, which, sown at intervals of from 12 to 18 days throughout the season, beginning with the earliest day of spring, and ending with the sowing of a small piece of rape and Hungarian grass in August, will bring them into the stables and cowstalls by the 15th of October in prime condition, a condition that the contents of the silo and the root-cellar combined with good sound dry food, will enable them to retain throughout the winter months with comfort to themselves and with profit to their owner.

In conclusion, allow me to say that I think a yard, provided with sheds and with shoots to carry off the rain, on three of its sides, but open to the

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south, will be found a more comfortable place to soil cattle in during the hot weather than a close stable. The only thing I see against it is that horned cattle will hunt each other about at first; but this might surely be obviated. One thing is certain: all pregnant animals require exercise, and although I am an advocate for the confinement of cow-stock during the winter months, I would give them as much liberty as possible during the summer.

I have made no remarks on the saving of manure made by soiling stock in well sheltered, well littered yards, as you all know as much of this or more than I can tell you.

ARTHUR R. JENNER FUST.

THE LAST IMPROVEMENTS IN THE MANUFACTURE OF BUTTER AND THE METHODS EMPLOYED IN DISTRIBUTING THE PRODUCT.

Mr. President and Gentlemen.

You will perhaps ask to what it is due that, to-day I, who have only been a few months in Canada, have the honour of addressing the meeting with some hopes of co-operating in the patriotic work that your important association has undertaken, and which it is carrying on with so much devotion and success.

This honour and this fortunate opportunity of being present at your annual convention, I owe to the kindness of your honourable secretary.

On my first voyage to Quebec, Monsieur Sylvestre had the goodness to hand me your seventh report. After having read it attentively, I felt convinced that I could not do better than continue to draw from so good a source my information about the agricultural industry of your province. So, I did not hesitate to send the expression of my wish to your board of direction, which hastened to forward me your last report with sundry other documents. In his polite letter, M. J. de L. Taché, while giving me notice of the parcel, invited me to come hither and take a share in your labours.

My position as a foreigner and an agricultural engineer of Belgium, no doubt won me this mark of good will. I could not shun accepting it, and, assured of your indulgence, I bring you the fruits of my studies and the experience of twenty years of practice.

I find it generally stated in your reports, in your newspapers, and other publications, that the exportation of Canadian butter has sensibly fallen off, particularly in the last few years.

Allow me to tell you, gentlemen, you have, in spite of this fact, everything necessary for the production of the goods most in request. Your Canadian cows yield an abundance of rich milk, your pastures are, in general, good, you give your cattle substantial and proper food in winter, and in summer, when the grass of your fields is parched by the sun, you supply them with additional or supplementary food. You have creameries that I may call models, very competent inspectors, and numerous agricultural clubs.

In spite of all these conditions, so suited to the production of first class butter, you find it difficult to compete, on the foreign market, with the products of northern Europe.

It would seem, then, that there exists a cause for this: perhaps there is some defect. If so, it must be discovered; the reason for this depreciation must be laid bare, and a remedy applied.

The ancient and inveterate *routine* which, without regard to distance, has penetrated from Europe as far as your new country; that is the enemy you have to conquer.

If I do not deceive myself, it is not a task accomplished, the dethronement of this monarch of the entire world; but you will succeed in it if you attack her bravely by diffusing the last *data* of science joined to matured practice. It is not everything to know the last improvements, they must be made to pierce their way among the agricultural population. Their application must be sound, you must secure the economical aid of the most improved apparatus and methods, and their advantages over the superannuated processes must be appreciated.

Such ought to be, nay, such is your aim, gentlemen, as I well know, and I should be happy if I could aid you in your object by the rapid sketch we are about to go over on the manufacture of butter, from the delivery of the milk to the marketing of its product.

FIRST PART.

Testing the milk.—A fundamental principle of all well managed manufactures is, that to ensure good products, good raw materials are necessary. It is, therefore, natural that our first business is the testing of the milk.

At the farm, the testing of the milk, when it is done, is generally only executed by means of indications (*à titre de renseignements*), but in private dairies, as well as in co-operative and other kinds, this work is imperatively necessary. To this end, in daily practice, it is highly desirable that the instructions given by your honourable secretary be conscientiously followed.

However, in large establishments, and especially in factories, the indications given by the lactometer and the creamometer are not sufficiently exact, though they will do if rigorously applied.

At present, the use of apparatus based on the centrifugal force is becoming general in the northern countries of Europe, and we cannot express ourselves too warmly as to the results they give. Their utility is no longer disputable, when there are large quantities of milk to treat, especially when this milk comes from different farms.

Dr. Fjord was the first to bring out a practical tester (*contrôleur*), which bears his name. It admits of the rapid and simultaneous verification of several samples of milk, whether it be full-milk, or more or less skimmed. This instrument, which is suited to the Burmeister and Wain separator, consists of a central piece bearing nine arms in the form of hooks, to which can be attached nine cylinders, each of which will hold two test-tubes containing the samples of milk under examination. These test-tubes are only simple cylinders of

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glass, of uniform diameter. When acted upon by the centrifugal force, the separation of the cream from the milk takes place, and the percentage of cream is calculated by means of a graduated scale. Forty or fifty minutes are enough to find out, with the strictest accuracy, the yield of 18 different samples. (1)

De Laval, too, has invented an arrangement fitted on to his separator. This apparatus, called a *Laktokrit*, is founded on chemistry and mechanics united; it gives with great speed the quantity of butter contained in the different samples of milk.

The principle involved is this: By treating the milk with an excess of acid and with heat, the casein and the phosphate of lime are dissolved, and the butter remains alone in suspension. Submitting this liquid to the action of centrifugal force, the butter-globules mass themselves together, and form at the upper part of the receiver an oily layer the volume of which is measured.

The apparatus consists of a *disc*, with 12 cavities hollowed out along the radius, into which are thrust graduated tubes enclosing the samples for examination. The disc is placed on a separate stand, or on that of the Laval separator, whence the turbine has been removed for a time. By giving a speed of six to seven thousand revolutions a minute to the machine, the butter is collected in five minutes, and all that remains is to read the number of divisions showing the quantity of butter separated.

The working of this machine requires a certain amount of skill. The practical use of it, however, is easily learnt, as is clear from the fact that I have known young girls, after only a couple of trials, acquit themselves very well, alone, in testing the quality of milk received at a factory.

Very recently, the use of another kind of test-instrument, the *Victoria*, less expensive and more handy than the others, has been rapidly making its way into our dairies. The milk to be examined is introduced, at about 75° , into phials with graduated necks. These are placed in sheaths mounted on the two journals (*tourillons*) of a central piece. The motion is by the hand, through a simple combination of gearing.

The sheaths, as in the Fjord machine, soon take a horizontal position, and very soon the quantities of cream in the different samples tested, may be read on the graduated necks of the phials.

This apparatus, so simple and yet so very useful, should be found in every well fitted up creamery and cheese-factory.

Skimming.—As soon as the milk has been received and tested, it must be skimmed. Over this, I will not detain you long, as I am well aware, you appreciate the numerous advantages of the mechanical separators.

Still, these machines cannot be yet used on every farm, on account of the too often trifling quantity of milk to be treated, and the absence of the *power* necessary for their working. During the last few years, de Laval has introduced his small hand-power and horse-power machines. Their comparatively high price has deterred the farmer from using them, and their employment will hardly ever become general. A year ago, a Belgian inventor, Mr. Melotte, brought out a separator on a new model, at a reasonable price, about \$100. This separator, that skims 30 to 35 gallons an hour, can be driven by hand,

(1) With the full-size Danish separator 192 samples can be tested at once.—J. de L. T.

without tiring the man, or by a horse-power; or, and this is the last improvement, only brought out this fall, by a dog of ordinary size.

Here is a short description of this most original apparatus. It displays a vast amount of knowledge on the part of its inventor of the laws that govern mechanical skimming.

In the Melotte separator, the steel turbine is hung on a single column, and receives its motion, through the agency of a roller-spring (*ressort à boudin*) from a well combined system of gearing. This arrangement annihilates entirely, so to speak, the intensity of the friction which makes the working of the other hand-separator so hard.

The turbine, properly so-called, encloses a spiral of tin, which forces the milk to yield more readily to the action of the centrifugal force. (1.)

A regulator, of simple though ingenious construction, allows the apparatus to be regulated with the greatest nicety, even during its movement; so that the quantity of milk, and the more or less concentration of the cream can be thereby controlled.

It appears to me useless to remind you that the milk submitted to the centrifugal force is the better skimmed in proportion to the nearness of its temperature, at the moment of the operation, to the degree of heat it possessed when it left the udder of the cow. It is enough to say that milk that has previously been cooled, to enable it to resist better the causes of tainting, should, in order to obtain successful skimming, be first brought back to a temperature of about 85°. I will only remind you of the heating apparatus of Ahlborn and de Laval, used for that purpose.

The preservation of cream and its acetification.—How should cream, when once skimmed, be kept, and for how long?

We know, now, that the want of aroma and flavour in butter is in proportion to the newness of the cream whence it is produced, and to the lowness of the temperature at which that cream has been kept. In other words, this aroma and this flavour are in direct ratio to the degree of acetification the cream has suffered.

Consequently, if export butter is desired, that is, butter able to resist the attacks of rancidity, we only churn fresh cream, in a sweet state, and previously cooled, if it has been skimmed by the centrifugal separator. While, if table butter be wanted, especially if it is to be unsalted, it is indispensable that it be more or less aromatic and sapid: this will necessitate the employment of cream more or less sour, according to the demand of the market.

Now, here arise two other questions of great importance, and these are still far from being clearly settled: 1. what are the effects of this acetification; and, 2. how far should it be carried?

The principal properties of butter are generally assigned to the food given to the cows; but, since the numerous investigations of specialists, and notably of Fleischman, the aroma of butter is attributed much more to the acetification of the cream, *i. e.*, to the transformation of certain elements of the cream itself by the lactic fermentation.

(1) Thirty-nine years ago, I saw at the R. A. Eng. Society's meeting, at Lewes, Sussex-Eng., a centrifugal machine for drying blankets, and other unwringable pieces of woollen stuffs. A. R. J. F.

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The recent inquiries of Mr. Duclaux into this question confirm this opinion, and explain this rule, already shaped by practice, that to obtain mild butter, the cream, if not churned as soon as skimmed, should be kept, as nearly as possible, at 45°; and in the case of salt butter being wanted for sale, with a more pronounced flavour, the temperature must be at least 60°, without ever exceeding 75°, (65° F.) and that for at least 24 hours before churning.

Churning.—This operation has a considerable effect on the quality as well as on the quantity of the product. I shall not say much on this subject, for I do not think I can do better than refer you to Mr. Lynch's pamphlet.

I must insist, however, on the importance of having an ice-house on the farm, and especially at a creamery; and also on another point too often forgotten, that is, that in no case, when hot water is added to the cream, should it exceed 100°.

For, cream, too rapidly heated, yields white butter of an inferior flavour, caused by the presence of too great a quantity of milk beaten into and enclosed in the butter-globules, which are thus impeded in their massing together (*agglomérer*).

The subject of churning must not be passed over lightly, for it affects equally both the quality and the quantity. Too rapid a motion burns (*brûle*) the butter, and, consequently, deprives it of its essential properties, such as delicacy of taste, and capacity of keeping. And, in addition, too fast revolutions do not gather all the butter-globules, and the butter-milk will contain too much fatty matter for the yield to be what it ought to be.

In general, the motion given ought to be regular; rather faster in winter and rather slower in summer.

The pace must clearly vary according to the kind of churn used, the arrangement of its agitators, beaters, etc.

In the choice of a churn, there are to be considered: the construction, the strength, the simplicity of its mechanism, the ease with which the butter can be washed, and the butter-milk extracted, the facility of cleaning and airing it, and lastly, and least of all, its price.

As to the size of the churn, it seems to me useless to mention it; only it is better to have it too large than too small, for even if there be not enough cream for a churning, water or sweet skim-milk can always be added, of course at the proper temperature. The employment of whole-milk, in such a case, would lower the yield, without improving the quality. Among the churns that are most sought after in our northern country, must be mentioned *The Danish*, known to you all as *The Victoria*. I have met in this country with this churn in many forms or variations; it is a simple cask turning on two journals. The bottom, which, undivided, serves as a cover, has a plug, to let out the gas, and a pane of glass, through which the progress of the butter can be watched. Nothing can be more simple, and yet, it is with this apparatus that in several recent trials the most delicate, the most refined butter has been made.

Washing butter, getting rid of the butter-milk.—It is now settled, that the churning ought to be stopped when the butter-globules have collected so

far as to form granules the size of a pin's head, and that the expulsion of the butter-milk should be proceeded with as soon as possible. (1)

The effect of this operation on the quality of the butter compels me to pause an instant, for it is on this part of the work that depends the keeping qualities of the butter, and the possibility of its being imported into foreign markets.

These systems are at present in use : 1. the expulsion of the buttermilk by means of water ; 2. the dry system ; 3. the mechanical method, by the centrifugal "*délaiteuse*" of Pilter and Baquet, of which the following is a description :

This machine, which can be driven by hand or by power, is composed of a hollow cast-iron column, ending in its upper part in an enlargement (*entasis*) in which is situated a turbine. This is formed out of a cylinder of sheet-iron, perforated with holes, and surmounted by a wrought iron ring, bearing a linen bag, in which is placed the mass of butter as soon as the globules are sufficiently gathered together and become firm. By a simple combination of gear work, the turbine acquires a speed of seven or eight hundred revolutions a minute, which is enough to ensure the expulsion of the buttermilk from the granulated mass. To get the butter to lump together, all that is required, afterwards, is a slight treatment with the butter worker.

Thus, the expulsion of the buttermilk by this machine is produced in the dry way.

The expulsion by water, was the first employed, and, in my opinion, is not yet ready to give place to the second method. Pourrian, himself, thinks it is indispensable to the entire purification of the butter from those foreign matters that favour its rancidity.

The fine butters of Normandy, which are reported to be the best in the world, are washed in the churn with water ; and yet they do not retain more water than those treated in the dry way.

The great merchants of Paris, who make a specialty of fine, well-flavoured butters, do not hunt after dry butter, but prefer butter with a small quantity of water in it, provided this water is perfectly pure.

The water used, which evidently must be fresh and of good quality, injures neither the aroma nor the taste of the butter ; still, it must not be used too largely, and above all it must not be employed as a means of increasing the weight. For, an excess of water in butter is not without effect on its keeping qualities. So, in export butters, we ought to aim at getting a mass as exempt as possible from all foreign matters, without being obliged to make too great use of the butter worker.

Malaxage or *working the butter*.—In truth, too long kneading heats and wears out the butter, and, at the same time, makes it lose colour and delicacy.

I have only two points to insist upon in treating this subject : uniformity in the mass is one, the other, it must not be touched with the hands.

Salting.—The working of the butter has also the effect of making the salting regular all through, but I confess I prefer salting by means of a brine, especially as regards butter for immediate sale. Even when it has to be

[1] We have no equivalent for the very modern French word *délaitage*. I wish we had. A. R. J. F.

marketed after a voyage, more or less long, I advise you to give it a moderate dose of salt in this way; it will not injure the delicacy of the flavour, and the preservation of the whole mass will be more certain.

Characteristics of the finest butter.—The goods, gentlemen, are now ready for market, and I have so many times spoken of “the qualities” of butter, without telling you what their characteristics are, that I can go on no longer without describing at least the principal ones.

Good butter should be neither soft nor brittle; it should have a slightly aromatic smell, a flavour like that of fresh hazel nuts, and be free from impurities and from buttermilk.

As to the flavour and aroma that characterise the finest butter, must we attribute their origin partly to the essential oils contained in the food of the cow, or entirely to the action of the fermentation that takes place during the acetification? On this important question, science has not said its last word. Nevertheless, M. Duclaux, at the close of his last inquiries, attributes great influence to the composition of the glycerides and the volatile acids.

Now, these are modified in direct ratio to the amount of acid contained in the bulk; which explains the great importance of the acetification of the cream, and, in consequence, of the temperature at which this ought to be kept up to the time of churning.

Without entirely gainsaying the influence of the breed of milch-cattle and the influence of the food of the cow, this important point of acetification, after all the other conditions of the work have been strictly complied with, enables us to make good butter, whether fresh or for keeping, in every part of the world. This I stand by, and I say that “proper care bestowed on the manufacture of butter, and particularly on the keeping of the cream, enables us to make, in Canada, butter as good as that of the north of Europe” and I even add “better butter; for the conditions of soil, climate, food and breed, are more suitable here.”

Sale of butter.—As, I fancy, all of you do, I think the producer ought to get rid of his make quickly, instead of becoming a speculator, and watching for the greater demand for its sale and dispatch. For, in fact, it often happens that butter, which, when fresh, would have brought a remunerative price, will no longer fetch it even when that good time comes, because it has lost its keeping qualities.

Let us apply, then, in this, as in all other branches of the business, the great principle of “the division of labour.”

The farmer has to furnish butter, and the dealer, who has all the proper appliances, fit premises, icehouses, knowledge of the variety of tastes and of wants on the part of his customers, &c., has to put it on the market, in accordance with the demands of the trade.

The makers of butter go directly to the nearest market, or they send off their goods to greater distances.

As to the former, and even to the other, I may say that a regular shape given to the pats will not be labour wasted; and a very clean cloth, or a paper made on purpose, placed round them, will certainly not drive customers away.

As to sending by rail or by other means, there are additional precautions to be observed. Without entering into long details on the subject, I must tell you that the following rule must be observed in every point: "Let your butter even in summer, be very firm, of great keeping quality; in colour, invariably uniform and pleasant to the eye, and of good but not too emphatic flavour and aroma."

If baskets are used for shipment, as they may be for short distances, the pats should be enveloped in linen cloths well washed in lye, well folded over, and fastened with pins; the whole to be placed in strong, well-closed baskets.

If tubs or earthenware pots be used, it is indispensable that the mass be well pressed down and homogeneous, so that the air may be completely expelled from it for the avoidance of rancidity. The vessel should be in good order, closed hermetically against air, and utterly incapable of communicating to the contents any bad flavour or any foreign colour. The same precautions must be taken if casks, or wooden, or tin boxes are used.

To make sure that the closing is hermetically sealed, the mechanical fastening is employed nearly everywhere nowadays, in place of the soldering of the covers, as this latter process had the effect of imparting a disagreeable smell to the butter.

I am satisfied that the diminution of the exportation of Canadian butter is not more attributable to the defective mode of making it on the farm, than to the want of homogeneity in the packages, and the little care taken of them. Doubtless, the rapid transit, the refrigerator cars, or at least cars well arranged, cool and fit storage on board ship, must have a happy influence, but more than all is it of the utmost necessity that the butter, before leaving home, be perfect in every respect, both in manufacture and packing. (1)

I was speaking, just now, of the influence of the air on the preservation of butter. In France, of late, carbonic acid gas has been made to take the place of atmospheric air in the vessels containing butter, and, it seems, with success. This quite novel process has not, at least to my knowledge, been tried long enough to make one sure of its good effects. However, practice will not be slow in pronouncing on its utility.

In Belgium, as well as elsewhere, other preservative agents have been extolled, but I confess, after several experiments, I have always returned to the use of scrupulous care, and to the common and ancient practice of employing well refined and thoroughly pulverised salt.

It remains for me, gentlemen, to conclude this first part of my essay by saying one word to you, and this word I should like to see written up everywhere, in the dairy, in the farm, in the cowhouse, in the creameries, in fact, everywhere, that the dairyman might have it always before his eyes. It is a very short and simple sentence:

(1) *Homogénéité* in the package, I take to mean that the butter in the tub, etc., should be all of the same quality, colour, and consistence. The original Greek word means: of the same race or quality. A. R. J. F.

As to the former, and even to the other, I may say that a regular shape given to the pats will not be labour wasted; and a very clean cloth, or a paper made on purpose, placed round them, will certainly not drive customers away.

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CLEANLINESS: WITHOUT THIS, THERE CAN BE NO
GOOD BUTTER.

It is on account of this primordial quality, as it is also on account of the delicacy of the work, that the dairy-man is almost unknown in our northern countries. The wife, or the young girl, who has almost always her share of the sentiment of cleanliness, has assigned to her, as her duty, the business of dealing with the milk; the man turning the churn, and, if there is one, managing the separator.

I was sorry not to see, in Canada, these dairy-maids, so neat and yet without extravagance in dress. On the other hand, I have often shared the idea of Mr. Lynch: "too many harmoniums and sewing machines."

DELICOUR.

HOED CROPS.

NOTES BY M. SÉRAPHIN GUÈVREMONT.

Mr. President and Gentlemen,

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

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

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

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

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

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

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

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

Here is an account of our operations:

8 arpents of potatoes,	yield	1500 bushels =	194 bushels per acre.
7 " swedes,	4500	780	
1 " red carrots	350	410	
1 " mangels	400	470	
1 1/2 " white turnips	200	460	
3/4 " maize	15	36	
18 arpents = 15.2 acres.			

On the same land in 1889, we sowed:

13 arpents in barley	yield	450 bushels =	40 bushels per acre.
2 " wheat	40	24	
3 " oats	120	46	

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

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

To us, neither of these arguments will apply. As to the first, as I said above, we bought this farm without paying a dollar in ready money for it; as

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to the second, I have no children at all, and my brother, who is ten years younger than I, is only beginning his family, the eldest of his children being only six; consequently, there being only we two to work, we are obliged to pay for all the other labour required.

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

Allow me to say, before I conclude, that it is a very fine thing to be one of fortune's favorites, as well as to have several children to help one; but although it is an advantage to be in either one of these situations, I can assure you neither is indispensable to success. There is one thing that is indispensable: earnestness; and to this I may also add: perseverance.

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

I bear this testimony here, without any exaggeration.

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

SÉRAPHIN GŪEVREMONT,
SOREL.

THE HOG AND THE DAIRY-INDUSTRY.

BY M. ANTOINE CASAVANT.

Mr. President and Gentlemen,

In 1889, I was requested to give you a description of a piggery. I showed you the advantages that are to be found in the most perfected buildings, which enable one to keep pigs all through the year, in the most suitable manner, and to consume the by-products of the dairy to the greatest profit?

At our last meeting, I spoke of the gains to be made, by selecting the best breeds, from the products of the dairy utilised in feeding hogs.

To-day, gentlemen, I am about to try to show you the benefit to be derived by the consumption of whey or butter-milk by pigs, both in rearing and in fattening them.

Every body knows, or ought to know, that of all the foods given to stock, milk is the most complete. It is important, therefore, to learn how to extract the greatest benefits from whey or butter-milk. The former is not so useful or so valuable as the butter-milk, but it has a certain value for fattening pigs, whereas butter-milk is best suited to rearing them. The young pig, more than any other animal, wants food containing the elements

needed for the formation of the bony frame, the muscles, the flesh and the fat. Now, milk is the food that contains these different elements in the greatest abundance, and forms the most complete of all the rations we give to our stock. By him who sends his milk to the creamery, the secret is already found out; he can rear young pigs throughout the season, because he has at his command milk that contains all the matters necessary both for rearing and fattening, and which thus offers every possible advantage to the breeder. I need not enter into any more details. Every one knows how to use milk in the rearing of pigs.

But, gentlemen, the position of those who send their milk to the cheese-factory is very different; the advantages are very much less. Still, with a well managed system of rearing, it is possible to make both these industries, *i. e.* cheese-making and pig-breeding, pay well; and I will now describe it:

Keep the breeding sows till they are three or four years old, and always select the best specimens to replace those you consign to the butcher. Arrange matters so that your sows pig about the beginning of March, and then the young will be weaned from about the 1st to the 10th of April; so that you can use the milk to the greatest advantage before the cheese-factories open, and when they do open, the young pigs will be sufficiently developed to support themselves on the whey, with the addition of meal, and, especially of green-meat; for green-meat is a food that contains more or less, according to its kind, of lime, sugar, nitrogen, albumen, and other matters, which make it an economical food, well fitted to maintain the pig in good health, and to facilitate the growth and the fattening of the animal. This precept is founded on my own experience.

As soon, therefore, as green-meat can be had; and by the term green-meat I mean pasture or green forage-plants, the weedings of the garden, cabbage-leaves, young clover and lucerne, corn-stalks cut green, such as we throw to our cows on pastures; give it to the pigs. By thus using your green-meat with whey, you can rear pigs very economically.

The weaning of the second litter of the year should take place from about the 15th to the end of October, *i. e.*, when the cheese-factories are about closing. This season does not offer the same advantages as the spring; we have not the green-meat to aid us; another treatment must be pursued. This treatment consists, in autumn, of keeping the young pigs in a warm place, to favour the rapidity of their growth, and feeding them on potatoes and sugar beets, or yellow-globe mangels, cooked together. I consider these two kinds of beets to be those best suited to the profitable feeding of pigs. To the above must be added oat-meal, pease, and milk. You see, gentlemen, that by this system all the milk is utilised, from the first milking of spring to the last of autumn. We are too apt to neglect the value of milk.

The products of the dairy-industry are three in number: butter, cheese, and milk. The cheese and butter find their way to the English market. Enough importance is generally attributed to these two articles, but the third product of the dairy, the milk is neglected; it is not sufficiently valued. A great part of it is lost for want of a proper system of employing it.

But observe, gentlemen; this is by no means an article to be despised, since we have a market for it here in the province, as may be found by the salt and fresh pork we import every year from the United States, and for which we have to lay out considerable sums.

To condense into three words the addresses I have made before the members of the Dairymen's Association on the piggery as connected with the dairy-industry, I would say that our business is: 1. to build convenient piggeries; 2. to select a good breed; 3. to grow plenty of vegetables for the supply of the milch-cows and the pigs. By these means, we shall succeed in furnishing sufficient quantities of pork for the demand of our country. It is always more profitable to sell our goods at home, than to send them abroad.

These, gentlemen, seem to me to be the practical means to be taken if we aim at increasing the revenues of the dairy-industry in our province.

Excuse me, gentlemen, for having taken advantage of your patience, and accept my thanks for your kind attention.

LA CAVALE 10 July 1890	CORNE D'OR 10 July 1890	LA BRUKE 10 July 1890	ANT. CASAVANT. Test began
lbs. ox 42-00	lbs. ox 40-00	lbs. ox 38-00	1st day
38-12	42-08	37-00	2nd "
38-00	42-12	35-12	3rd "
37-04	42-08	34-04	4th "
40-08	41-04	32-12	5th "
38-04	40-12	30-00	6th "
30-00	42-08	37-04	7th "
27-12	303-04	252-00	
49 lbs	57 lbs	45 lbs	Total quantity of cream
lbs. ox 10-11	lbs. ox 11-10	lbs. ox 13-11	Total quantity of butter yielded
3.98	3.96	5.30	Butter from 100 lbs of milk
22.48	22.23	18.82	Pounds of milk required to the pound of butter

The prizes will be given in the order of the yields if the competing cows, which have not been examined, are really thoroughbred Canadian, and eligible for entry into the herd-book of Canadian cattle.

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the fat. greatest r stock. id out; mmand ttening, eed not rearing cheese- with a ries, i. e. : always Arrange hen the at you es open, to sup- cially of rding to make it to faci- nded on en-meat cabbage- throw to en-meat m about t closing. e not the reatment our the beets, or beets to must be ystem all mn. We r, cheese, market. the third lued. A young pig

COMPETITION OF REGISTERED CANADIAN COWS.

The following cows were entered for the competition of 1890:

1o. "La Brune;" the property of M. Solomon Philibert, St. Justin de Maskinongé.

2o. "La Corne d'Or;" the property of M. Edouard Philibert, St. Justin de Maskinongé.

3o. "La Caille;" the property of M. Désiré Philibert, St. Justin de Maskinongé.

La Caille had already competed, in 1889.

Here follows a condensed report of the list of the three competitors.

Test began		1 LA BRUNE 10 July, 1890	2 CORNE D'OR 10 July, 1890	3 LA CAILLE 10 July, 1890
Milk given each day	1st day....	lbs. oz. 39-00	lbs. oz. 40-00	lbs. oz. 42-00
	2nd "....	37-00	42-08	38-12
	3rd "....	35-12	42-12	38-00
	4th "....	34-04	43-08	37-04
	5th "....	38-12	41-04	40-08
	6th "....	36-00	40-12	36-04
	7th "....	37-04	42-08	39-00
			258-00	293-04
Total quantity of cream.		45 lbs.	57 lbs.	49 lbs.
Total quantity of butter yielded.		lbs. oz. 13-11	lbs. oz. 11-10	lbs. oz. 10-11
Butter from 100 lbs. of milk.		5.30	3.96	3.93
Pounds of milk required to the pound of butter.		18.85	25.23	25.43

The prizes will be given in the order of the yields, if the competing cows, which have not been examined, are really thoroughbred Canadians, and eligible for entry into the Herd-book of Canadian cattle.

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RECEIPTS AND EXPENDITURE

OF THE ASSOCIATION FOR THE YEAR 1890.

RECEIPTS.

Subsidy to the association (1).....	\$1000.00
Subsidy to the school-factory (2).....	Memo
Members' subscriptions.....	402.00
Sale of reports.....	3.90
Divers receipts.....	297.37
	<hr/>
	\$ 1703.27

EXPENDITURE.

Printing.....	\$ 55.00
Stationery, postage, &c.....	82.97
Directors' travelling expenses.....	17.10
Subsidies.....	136.98
Salaries.....	550.00
Travelling expenses, instruction.....	394.75
Prizes for the competition.....	70.00
Divers expenses.....	221.08
	<hr/>
Balance on hand.....	\$ 1,527.88
	<hr/>
	\$ 1,703.27

REPORT OF THE AUDITORS.

After examining in detail the above accounts and comparing them with the vouchers, we declare them to be correct.

Sorel, November 25th, 1890.

(Signed) AD. BRUNEAU }
J. C. CHAPPAIS } Auditors.

(1) \$500 still due from the Department of Agriculture.

(2) Paid directly to M. J. M. Archambault, by the Department of Agriculture [\$300.]

LIST OF MEMBERS.

YEAR 1891.

A

- Archambault, J. Misael..... St-Hyacinthe
- Allard, Pierre..... St-Alphonse de Granby
- Allard, Jos. Nap..... Warwick
- Asselin, Chs..... South Durham
- Adam Delvica..... St-Valérien
- Adam, N..... St-Zéphirin de Courval
- Allard, J. L..... St-Martin de Laval
- Archambault, P. A. O..... L'Assomption
- Arsenault & Frères..... Sorel
- Archambault, J. B..... Sorel
- Aganière Joseph..... St-Malo d'Auckland
- Alexander, Neil..... Chicoutimi

B

- Barnard, E. A..... Trois-Rivières
- Bellisle, Achille..... La Baie-du-Febvre
- Brodeur, L. Thimothée..... St-Hugues
- Bernatchez, N..... Montmagny
- Blondin, F. X..... St-Maurice
- Beaubien, Louis..... Montreal
- Bernatchez, Numa..... Montmagny
- Bilodeau, Jean..... St-Elzéar de Beauce
- Baril, Pierre..... St-Justin
- Bourque, Norbert..... Sherbrooke-East
- Bourbeau, S..... Arthabaska
- Baudry, Pierre..... St-Jean-Bte de Rouville
- Bourbeau, Elie..... L'Ange Gardien
- Bruneau, Dr. Ad..... Sorel
- Boucher, Jos..... St-Damien
- Bergeron, Henry..... St-Didace (Maskin)
- Bernier, Alphonse..... Ste-Claire (Dorch)
- Beauregard, Joseph..... Ste-Angele
- Bergeron, Alph..... St-Antoine de Tilly
- Boucher, Euclide..... St-Damien
- Boucher, Pierre..... St-Alexis des Monts

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 Bérub
 Berger
 Beausé
 Buisso
 Bussiè
 Blouin,
 Boisve
 Blais, A
 Boucha
 Brassar
 Brassar
 Binet, J
 Boulais,

 Chicoin
 Chartier
 11

Boucher, Louis	Tremblay
Boucher & Leclerc	L'Islet
Bou langer, Oct	Ste-Agathe de Lothinière
Breton, Aug	N. D. du Sacré Cœur
Boivaine, Evariste	St-Zépherin de Courval
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Boland, George	Ste-Ursule de Maskinongé
Bourbonnais, J. A.	Pontchâteau
Bé langer, J. J.	L'Isle Verte
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Blanchette, Geo	Walker's Cutting
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Bradette, Jules	La Malbaie
Boismenu, Nap.	Ste-Thérèse
Bayeur, Dolphis	East-Angus
Boudreau, Rév. M.	Valcourt d'Ely
Bombardier, Hypolyte	Valcourt d'Ely
Bourbeau, D. O.	Victoriaville
Bibeau, Louis	St-Flavien
Benoit George	Kingsey French Village
Boucher, Jos	Coaticook
Boudreau, Zoel	Pointe-aux-Pères
Bernier, Cyp.	L'Anse à Gilles
Blanchard, Henry	St-Joachim de Shefford
Brodeur, Théophile	St-Hyacinthe
Brodeur, Ephrem	Somerset
Bérubé, Rev. M. A. P.	Little Cascapédia
Bergeron, Alph.	Ste-Croix de Lotbinière
Beauséjour, C.	St-Michel des Saints
Buisson, Arsène	Ste-Cécile de Lévrard
Bussière, Ambroise	Ste-Jeanne de Neuville
Blouin, Jos	St-Jean, Ile d'Orléans
Boisvert, Alex.	Ste-Elizabeth
Boisvert, Adé lard	St-Elphège
Blais, Alexandre	Chicoutimi
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Brassard, Jos	Rivière-aux-Sables
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Chênevert, Jos.	Berthierville
Côté, Louis	St-Hyacinthe
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Cardin, Pierre	Sorel
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Cartier, T. C.	Kingsey French Village
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Morisset, Honoré.....	St-Donat

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Philibert, Edouard	St-Justin
Pepin, Léger	Lotbinière
Paradis, Louis	St-Isidore de Dorch
Proulx, Rév.	Nicolet
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Rochette, Phidime	St-Augustin de Portneuf
Rculeau, Emile	Ste-Hénédine de Dorch
Roy, Fortunat	Coaticook
Robert, M.	St-Valérien
Regimbal, Jos.	Ste-Thérèse
Rainville Louis	Arthabaskaville
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Robert, Robert	Ste-Anne de Stukely
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Robitaille, Louis	Pointe-aux-Trembles
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