

TENTH REPORT  
OF THE  
DAIRYMEN'S ASSOCIATION  
—OF THE—  
PROVINCE OF QUEBEC.

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

1891.

PRINTED BY ORDER OF THE LEGISLATURE.



QUEBEC:  
PRINTED BY CHARLES FRANCOIS LANGLOIS.  
PRINTER TO HER MOST EXCELLENT MAJESTY THE QUEEN.

1891.

TENTH REPORT

DAIRYMEN'S ASSOCIATION

PROTECTIVE OF CATTLE

PRESENTED TO THE BOARD OF THE PROVINCE OF QUEBEC  
BY THE DAIRYMEN'S ASSOCIATION

1881

PRINTED BY ORDER OF THE LEGISLATIVE COUNCIL



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1881

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To the

SIR,

The Board  
of Quebec has t  
during the year  
27th and 28th o

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Quebec, March,

TENTH 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 1891, and of the Annual Meeting held at Montmagny, the 27th and 28th of January last.

THE SECRETARY-TREASURER OF THE DAIRYMEN'S  
ASSOCIATION OF THE PROVINCE OF QUEBEC,

J. DE L. TACHÉ.

Quebec, March, 1892.

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TENTH ANNUAL REPORT  
DAIRYMEN'S ASSOCIATION

PROVINCE OF QUEBEC

The Board of Directors of the Dairymen's Association of the Province of Quebec has the honor to bring you the following report of its operations during the year 1901, and of the Annual Meeting held at Montreal on the 25th of January last.

THE SECRETARY-TREASURER OF THE DAIKYMEN'S ASSOCIATION OF THE PROVINCE OF QUEBEC

J. DE J. TACHE

Officers and

Honorary President

Honorary Vice-President

President

- Arthabaska.....
- Beauce.....
- Beauharnois.....
- Bedford.....
- Charlevoix.....
- Chicoutimi and Sagouay.....
- Herville.....
- Joliette.....
- Kamouraska.....
- Montmagny.....
- Montreal.....
- Quebec.....
- Richelieu.....
- Sarnouski.....
- St. François.....
- St. Hyacinthe.....
- Terrebonne.....
- Three Rivers.....

# Officers and Directors of the Dairymen's Association

## FOR 1892.

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

Honorary Vice-President : M. N. BERNATCHEZ, M.P.P., Montmagny.

President : L'ABBÉ T. MONTMAGNY, St. George de Beauce.

Vice-President : S. A. FISHER, Knowlton.

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.....	J. A. HAYES.....	Sheffington.
Charlevoix.....	CHAS. MARTEL.....	La Baie St. Paul.
Chicoutimi and Saguenay...	F. PARADIS.....	Bagotville.
Herville.....	O. BERGERON.....	St. Athanase.
Joliette.....	I. J. A. MARSAN.....	L'Assomption.
Ramouraska.....	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.
Simouski.....	A. NICOLE.....	St. Simon de R.
St. François.....	D. O. BOURBEAU.....	Victoriaville.
St. Hyacinthe.....	L. T. BRODEUR.....	St. Hugues.
Terrebonne.....	FRS. DION.....	Ste. Thérèse
Three Rivers.....	L'ABBÉ D. GÉRIN.....	St. Justin.

## 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 page 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 affairs and property, 45 v., c. 66, s. 5. (1)

(1) Articles 1753 *a, b, c, d* and *e*, were added to the charter of the association, by chap. 11 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

AN ACT TO AMEND THE LAW

Whereas, under the the Industrial Dairy Ass

Whereas the said a dicates for the purpose of the best methods to be tion of dairy produce a industry ;

And whereas the saic mittee on Agriculture an by the Legislative Assem

Therefore, Her Majes Legislature of Quebec, en

**1.** The following arti Statutes of the Province o

"**1753a.** The associat and complete diffusion of tion of milk, the fabricatio ment of the dairy industr divisions, in which syndi cheese factories and other

The formation and wo regulations made by the sa Governor in Council ; and and supervision of the Ass

To such syndicates, th out of the Consolidated Re expenses incurred for the s therein, including the sa expenses directly connected hundred and fifty dollars f

"**1753b.** The inspecto ed by the Lieutenant-Gove certificates of competence fr 1753d.

## 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 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 Colonisation 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 organised 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.

association, by chap. xx  
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The inspectors are to superintend the production and supply of milk, as well as the manufacture of butter and cheese in the establishments so organised 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

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AN ACT TO PROVIDE

HER MAJESTY  
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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.

NAMES,	\$	CTS.

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

production and supply of milk and cheese in the establishment in conformity with the regulations approved by the Lieutenant-Governor in Council.

shall be paid by the Association.

to be passed by the Association in Council.

appointed by the Association as an office of inspector, and approved by the Lieutenant-Governor in Council.

of one thousand dollars, for the use of the syndicates, and for the expenses of the miners above mentioned."

of its sanction. meeting, at such time and place as the directors, besides those appointed by the by-laws.

shall elect a president, and a director for each judicial district of the association,

association shall prepare and submit to the Association a detailed report of their names of all the members of the Association, and the names of the acts which deserve public notice, which they deem useful in the interest of the Association.

into an association under the authority of title fourth of the Revised Statutes of the Province of Quebec, in conformity with the regulations approved by the Lieutenant-Governor in Council.

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 page 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 purpose 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 in which the notice of the formation of the association is published in the Quebec Official Gazette.

" **1755h.** The association shall hold an annual meeting, at such time and place as shall have been selected by the board of directors.

" **1755i.** At such annual meeting, the members of the association present shall elect three directors from each county forming the judicial district for which the association is formed, chosen from the members of the association domiciled in said counties, who shall constitute the board of directors of the association.

" **1755j.** The board of directors shall elect, from their members, a president and a vice-president, and shall appoint a secretary-treasurer and such other officers and employés as they may deem necessary for carrying out the objects of the association.

" **1755k.** The d  
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the dairy industry.

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Province of Quebec.

2. This act shall

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" 1755k. The directors shall prepare and present at the annual meeting of the association a detailed report of their operations during the past year.

Such report shall indicate the names of all the members of the association, the amount subscribed and paid into the hands of the secretary-treasurer, the names and number of the factories in their district, and give such other information deemed useful and in the interest of agriculture and the dairy industry.

A triplicate of such report shall be transmitted to the Commissioner of Agriculture of the Province, and another to the Dairy Association of the Province of Quebec.

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

#### SCHEDULE

MENTIONED IN ARTICLE 1755b.

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

NAMES.	\$	CTS.

## 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 "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-laws, 45 V., c. 65, s. 3.

**5481.** A book of shares, and the society, 45 V.,

**5482.** Each of to the inspection of

**5483.** During statement of its operation of Agriculture section, 45 V., c. 65

49

## AN ACT TO PROHIBIT

Whereas the manufacture and exposure of such goods is deemed expedient to prohibit Her Majesty, by and with the advice and consent of the Commons of Canada,

**1.** No oleomargarine shall be manufactured from any animal or vegetable fat in Canada, or sold there, in violation of the provisions of this Act in excess of four hundred pounds weight, and, in default of payment of the duty exceeding twelve months

52 V

## AN ACT TO PROVIDE AGAINST

AND

Her Majesty, by and with the advice and consent of the House of Commons of

(1) The Ontario courts have no jurisdiction to subject like that which exists to this judicial decision, and as a measure of prudence, be

**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-laws shall be constantly open to the inspection of the members of the society, 45 V., c. 65, s. 5.

**5483.** 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 Colonisation by each society formed under this section, 45 V., c. 65, s. 7 ; 50 V., c. 7, s. 12.

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### SCHEDULE

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.

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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) 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.

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 person 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.

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 *primâ 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 *primâ 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 under the Act, shall be held to be a conviction under the Convictions Act," a manufactured, notw elsewhere.

9. No appeal shall be allowed from the Judge of a Superior Court or judge of the Court of Sessions, if the conviction was by a Justice of the Peace, in writing given, within ten days after the date of the conviction, upon and decided in the same place as the court or judge from the date of conviction, for time for hearing and respects not provided for in the Convictions Act," so

10. Any person convicted, or wife of such person

11. Any pecuniary amount recovered, be payable to the owner of the other half to the owner of which milk was sent, in violation of any of the provisions of the Act, the patrons thereof in thereof.

## CONSTITUTION

INCORPORATE

1. The Association of the Province of Ontario
2. The object of the manufacture of butter above manufacture.
3. To become a member of the Association one dollar (\$1.00) a year

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, recognisance 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 offence 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 interest in the product thereof.

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## CONSTITUTION OF THE DAIRYMEN'S ASSOCIATION.

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INCORPORATED BY THE STATUTE 45 VICT., CHAP. 66, P. Q.

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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 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 ensure 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 committee to audit the accounts shall be such as the board think necessary.

5. The order of business shall be determined by the board of directors.

6. No question shall be brought before the board unless it has been previously announced.

7. The secretary-treasurer shall be allowed an amount of \$400 00, with the board.

SYNDICATES

BY-LAWS ADOPTED BY THE BOARD OF DIRECTORS OF THE ASSOCIATION

COPY of the report of a Commission of Enquiry, 23rd, 1891, appended to the Report of the Board of Directors (Translation).

No. 75.— On the 10th of June 1891, the Board of Directors of the Association.

The Hon. the Commissioner of the Province of Quebec, recommends that the following be approved.

Certified true

REGULATIONS

Whereas, by a law of the Province of Quebec, the Government was authorised to create creameries, cheese-factories, and to facilitate the complete diffusion of the benefits of the manufacture of dairy industry;



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.

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#### SYNDICATES OF CHEESE AND BUTTER FACTORIES.

BY-LAWS ADOPTED BY THE DAIRY INDUSTRY ASSOCIATION AND ASSENTED TO BY THE LIEUTENANT-GOVERNOR IN COUNCIL.

*Copy of the report of a Committee of the Honourable Executive Council, dated January 23rd, 1891, approved by the Lieutenant-Governor, January 24th, 1891. (Translation).*

No. 75.— On the approval of certain regulations of the Dairymen's Association.

The Hon. the Commissioner of Agriculture and Colonisation, in a memorandum, dated the twenty-third of January of the current year, 1891, recommends that the regulations of the Dairymen's Association of the Province of Quebec, a copy of which is annexed to the above memorandum, be approved.

Certified true copy.

(Signed),

GUSTAVE GRENIER,  
Clerk of the Executive Council.

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#### REGULATIONS OF THE DAIRYMEN'S ASSOCIATION.

Whereas, by a law passed at the last session of the Legislature of the Province of Quebec, the Dairymen's Association of the Province of Quebec was authorised to create regional divisions in which the proprietors of creameries, cheese-factories, and other dairy establishments may form themselves into syndicates for the purpose of securing a more prompt and complete diffusion of the best methods of conducting the production of milk, the manufacture of dairy-products, and the advancement in general of the dairy-industry ;

And whereas the said association was, by the same law, entrusted with the duty of :

1. Establishing regulations for the formation and working of the said syndicates ;

2. Of directing and superintending the syndicates ;

3. Of establishing rules to define the duties of the Inspector-General and of the inspectors who are to superintend the production of milk and the manufacture of butter and cheese in the establishments so organised into syndicates ;

4. Of appointing a board of examiners for the examination of candidates for the office of inspectors, and of laying down regulations for the working of the said board ;

And, Whereas, there is granted to each syndicate a sum equal to half the outlay incurred for the service of inspection and instruction organised in the syndicates, including the salary of the inspector, his travelling expenses, and other expenses relating directly to the said service, but which sum granted must not in any case exceed \$250 (two hundred and fifty dollars) for each syndicate ;

Whereas, there has been granted to the said association, besides its subsidy and other ordinary concessions, an additional sum of \$1,000 (one thousand dollars), for the expenses necessary for the direction and superintendence of the syndicates, as well as for the maintenance and due working of the board of examiners above mentioned ;

The said association constitutes, as follows, the programme of the formation and working of the syndicates, of their direction and superintendence, of the manner of conducting the proceedings of the board of examiners, and of the duties of the inspectors :

## I

## DIVISION OF THE PROVINCE.

The province shall be divided as follows, for the purposes of the new organisation :

a. Syndicates of cheese-factories or of cheese-factories and creameries:

No. of the division.	Counties comprised in the division.
1.	Gaspé, Bonaventure, Matane, Rimouski, Témiscouata.
2.	Kamouraska, L'Islet, Montmagny, Bellechasse.
3.	Dorchester, Lévis, Beauce.
4.	Lotbinière, Mégantic, Arthabaska.
5.	Nicolet, Yamaska.
6.	Drummond, Richmond, Wolfe.
7.	Sherbrooke, Stanstead, Compton.
8.	St. Hyacinthe, Bagot, Richelieu.

9.	Rouville,
10.	Shefford,
11.	Verchères,
12.	Beauharn
13.	Huntingd
14.	Saguenay
15.	Portneuf,
16.	Three-Riv
17.	Montcalm
18.	Hochelaga tagn
19.	Argenteuil
20.	Vaudreuil,

b. Syndicates of B

As any limitation of syndicates of butter existing in the province to organise themselves in the united counties shall constitute a territorial regulations.

## DIRECTION AND

1. The association s

a. By means of a fo season of manufacture, t at once, and distributed tion and those of the pu bulletin shall contain, e ducers of milk, patrons c butter, relating more sp each number; it shall als the dairy-industry.

b. By means of the s be conducted with a vie

2. The superintende association :

a. Through the Insp whose duties and office w

9. Rouville, Iberville, St. John's.
10. Shefford, Brome, Missisquoi.
11. Verchères, Chambly, Laprairie, Napierville.
12. Beauharnois, Châteauguay.
13. Huntingdon.
14. Saguenay, Lac St. Jean, Chicoutimi, Charlevoix.
15. Portneuf, Quebec, Montmorency.
16. Three-Rivers, Champlain, St. Maurice, Maskinongé.
17. Montcalm, Joliette, Berthier, L'Assomption.
18. Hochelaga, Jacques-Cartier, Laval, Terrebonne, Deux-Montagnes.
19. Argenteuil, Ottawa, Pontiac.
20. Vaudreuil, Soulanges.

*b.* Syndicates of Butter-Factories.

As any limitation of territory would be a hinderance to the formation of syndicates of butter-factories, on account of the small number of such existing in the province, liberty may be granted them by the association to organise themselves in accordance with the following regulations; and the united counties in which such a syndicate shall have been formed shall constitute a territorial division for all the purposes of the present regulations.

II

DIRECTION AND SUPERINTENDENCE OF THE SYNDICATES

1. The association shall direct the working of the syndicates.

*a.* By means of a fortnightly or monthly bulletin published during the season of manufacture, the prospectus-number of which will be published at once, and distributed among the old and new members of the association and those of the public who are interested in the dairy-industry; this bulletin shall contain, especially, instruction and advice to farmers, producers of milk, patrons of factories, to inspectors and makers of cheese and butter, relating more specially to the time of year following the issue of each number; it shall also contain general information in connection with the dairy-industry.

*b.* By means of the school-factory of the association, whose work shall be conducted with a view to the new organisation.

2. The superintendence of the syndicates shall be exercised by the association :

*a.* Through the Inspector-general and the inspectors of the syndicates, whose duties and office will be defined hereafter;

*b* Through its ordinary officers as regards all private or public communications it may have to make to the representative of the syndicates of the factories syndicated.

3. The association does not pretend to exercise any control over the interior management of the financial arrangements of the syndicates: it will suffice, if the latter conform to the present regulations to entitle them to be considered as having accepted the direction and superintendence of the association.

4. The direction and superintendence of the association shall be exercised with a view to securing, especially in the syndicated establishments:

*a.* A regular attention to the testing of the patrons' milk in order to obtain from them milk of the best quality, neither skimmed, nor watered, nor adulterated in any way.

*b.* A scrupulous attention to the general keeping in order of the factories, and to the maintenance of cleanliness therein;

*c.* Good quality and uniformity in the products manufactured;

*d.* A uniform system of book-keeping, sufficient to insure the exactness and integrity of the operations of the year, which each factory will have to furnish to the association.

### III

#### ORGANISATION AND WORKING OF THE SYNDICATES.

1. A syndicate shall be constituted by the associating together of creameries, cheese-factories, or other dairy-establishments, to the number of not fewer than (15) fifteen, or more than (30) thirty; it shall have for its aim the spreading over the division in which it is formed of the best methods of producing milk and of manufacturing dairy products; it may also aim at adopting and exercising all measures calculated to protect such interests of the patrons and proprietors as are to the general advancement of the dairy-industry: the proprietors or representatives of the syndicated factories shall for that purpose engage to support between them, in a proportion left to their discretion, the expense of the hiring of one or more experienced inspectors, who shall superintend the production and the supplying of the milk, as well as of its manufacture into cheese and butter in the syndicated factories. The inspector shall be under the direction of the Dairy-men's Association, under the conditions hereinafter enumerated, and the syndicate shall conform to the present regulations.

2. The syndicates shall organise, as much as possible, by the beginning of the manufacturing season.

3. The syndicate shall organise by the signature in duplicate of the proprietors or the representatives of the factories who wish to form themselves into a syndicate to a declaration, on a printed form, which shall be

furnished by the association, without delay to the secretary on receipt.

4. In each territory where there are cheese-factories or of which a syndicate is to be established.

5. If in any division there is no representative, the representative shall be chosen with those of a neighboring part of an already existing syndicate.

6. Every factory shall be a member of its divisional syndicate.

7. Every syndicate shall be formed from uniting in the case provided for in the regulations.

8. For special reasons, certain factories of a division, provided that they are members of the syndicate in the form of a syndicate.

9. The representative shall be named a president, a vice-president, and the officers of the syndicate; all official correspondence shall be signed by the secretary-treasurer.

10. At the end of each year, an account, certified by its members, shall be rendered for his travelling and other expenses, such as hire of carriage, postage, purchase of ink, &c.

11. As the government may think fit to grant a subsidy for the inspection, this grant shall not exceed two hundred francs, and shall only be made at the end of the preceding year to the syndicate.

12. A subscription list shall be drawn up by the representatives of each factory, and sent to the dairy association in order that the makers of the association may be notified of the association; moreover, a complete certified copy shall be sent to the official form adopted by the government, public except by consent.

furnished by the association, and a duplicate of which shall be sent without delay to the secretary of the association, who shall acknowledge its receipt.

4. In each territorial division, syndicates composed exclusively of cheese-factories or of creameries, or of creameries *and* cheese-factories, may be established.

5. If in any division there be not found a sufficient number of factories whose representatives desire to form a syndicate, these factories may agree with those of a neighbouring division to form a syndicate, or to become part of an already existing one.

6. Every factory shall have the right to ask for admission into the syndicate of its division.

7. Every syndicate shall have the right to prevent any factory of its division from uniting with a syndicate of a neighbouring division, except in the case provided for by the following article.

8. For special reasons, the association shall be empowered to allow certain factories of a division to unite with the syndicate of a neighbouring division, provided that this permission hinder not the formation of a syndicate in the former division.

9. The representatives of the factories associated into a syndicate shall name a president, a vice-president, and a secretary-treasurer, who shall be the officers of the syndicate, and whose address shall be given to the association; all official correspondence shall be carried out by the medium of the secretary-treasurer.

10. At the end of each season, the syndicate shall render an exact account, certified by its secretary-treasurer, of the salary paid to its inspector, his travelling and other expenses in direct relation to his duties of inspection, such as hire of carriages, railway and steamboat fares, board, stationery, postage, purchase of instruments for the inspector's use, &c., &c.

11. As the government grant is given specially for the service of inspection, this grant in no case shall exceed the half of the genuine amount of the expenses alone just mentioned, provided that half does not exceed two hundred and fifty dollars (\$250.00); and the payment thereof shall only be made at the end of the dairy-season, after the report mentioned in the preceding article shall have been made to the association by the syndicate.

12. A subscription shall be paid by the proprietors, or by the representatives of each factory, to the provincial Dairymen's Association or to the dairy association of the district in which the syndicate is formed, in order that the makers or the directors may be kept *au courant* of the work of the association; moreover, they shall forward to the provincial association a complete certified report of the operations of their factory according to the official form adopted by the association; which shall not be made public except by consent of those therein interested.

## OF THE INSPECTOR-GENERAL AND THE INSPECTORS OF SYNDICATES.

1. The Inspector-General and the inspectors of syndicates are appointed by the Lieutenant-Governor-in-Council; but in neither case will any one be appointed until he shall have previously undergone an examination sufficient to establish his qualifications before the board of examiners of the association. The inspector-general shall be paid by the association, and the other inspectors by the syndicates.

2. The duties of the inspectors belonging exclusively to the teaching of the best methods of the production of milk and its proper supply to the factories, the manufacture of dairy-products, correct accounts, and the orderly management of the factories, these officers shall carefully avoid meddling with any troubles, with which their duties have no concern, whether they arise between neighbouring factories, between buyers and sellers, or between patrons and proprietors. They must, under pain of immediate dismissal, observe most guarded discretion in regard to all matters they note in the exercise of their duties, and reveal them to no one except to the society or to the officers and servants of the factories concerned.

## § 1. OF THE INSPECTOR-GENERAL.

1. The Inspector-General is the representative of the association accredited to the proprietors, the makers, and the representatives of the establishments under syndicates; all the instructions, therefore, he shall give, with the approbation of the association, are to be observed.

2. Before the opening of the season, or even during the season, if he see fit, or if he receive orders to that effect from the association, the Inspector-General shall call together the inspectors of syndicates, by groups, at the school-factory of the association, or at some other factory, and, keeping them there a few days, instruct them in their duties and in the best methods of manufacture.

3. After the opening of the season, the Inspector-General shall keep himself in communication with the inspectors of syndicates, by going at different times to pass two or three days alternately with each of them, to ascertain the efficiency of their services, their attention to instructions given, and the good management of the factories they have in charge. In these visits the Inspector-General will not be so much bound to visit the factories in particular, as to follow the steps of the inspectors in their ordinary duties.

4. The Inspector-General shall lend his aid to the working of the school-factory, which he shall visit, taking it in turn with the syndicates.

5. The Inspector-General shall keep a note in which he shall inscribe the work of each of the factories; these notes shall be printed in time to be printed of public interest shall be printed daily account of his work.

6. With the consent of the model establishments, the Inspector-General shall study and of public interest shall be printed passed into the current of the day.

7. At the end of the complete report of his duties he has made; matters interesting to each of the inspectors.

§ 2. - 0

1. The inspectors of syndicates, questions of interior management, &c., are under the control of the Inspector-General.

2. As regards the management of the syndicate is under the direct control of the Inspector-General, he shall give form to the instructions of the Inspector-General.

3. The wages, travelling expenses, &c., paid by the syndicate.

4. It is obligatory on the Inspector-General to call together by the Inspector-General.

5. After the meeting of the syndicate, at the opening of the season, the Inspector-General shall give one of the earliest openings of the season, the information he has received.

6. In order to learn the state of their business, the Inspector-General shall visit the factories he has in charge; this visit shall be made to the least skilled makers of the syndicate, and he shall visit those whom he thinks it necessary to visit.

7. After having finished his duties, the Inspector-General shall attend to his affairs, and having helped the syndicate, he shall give assistance and advice, the Inspector-General shall attend to his regular routine journey.

5. The Inspector-General shall keep, in duplicate, a special note-book, in which he shall insert, day by day, all the observations he makes on the work of each of the inspectors, and on the general management of their factories ; these notes shall be regularly communicated to the association, in time to be printed in each number of the bulletin, in which everything of public interest shall be inserted ; the Inspector-General shall also keep a daily account of his travelling and other expenses.

6. With the consent of the association, the Inspector may visit the model establishments of this province or of Ontario, for the purpose of studying and of publishing any new process of working which may have passed into the current practice.

7. At the end of the season, the Inspector-General shall prepare a complete report of his work, giving a condensed statement of the observations he has made ; this report shall be in two parts : one containing matters interesting to the public, the other, private notes on the work of each of the inspectors.

#### § 2. — OF THE INSPECTORS OF SYNDICATES.

1. The inspectors of the syndicates are their servants, and as regards questions of interior management, such as wages, payment of expenses, &c., are under the control of the officers of the syndicates.

2. As regards the performance of his duties, the inspector of a syndicate is under the direction of the association, and he must strictly conform to the instructions received from its officers or from the inspector-general.

3. The wages, travelling and other expenses of the inspector are to be paid by the syndicate.

4. It is obligatory on each inspector to attend all the meetings called together by the Inspector-General.

5. After the meeting convoked by the Inspector-General before the opening of the season, the syndicate-inspector shall convoke his makers in one of the earliest opened factories, and shall repeat to them all the information he has received from the Inspector-General.

6. In order to learn as soon as possible how far his makers understand their business, the inspector shall visit as quickly as possible all the factories he has in charge ; this done, he shall devote himself to the assistance of the least skilled makers, passing a day with each of them ; later, he shall visit those whom he thinks the most skilful.

7. After having thus made himself acquainted with the situation of affairs, and having helped each maker, in proportion to his needs, with his assistance and advice, the inspector shall arrange his visits so as make a regular routine journey from factory to factory.

8. After or about the 1st June, the inspector shall so divide his work that between two visits made to the same factory no greater number of days shall elapse than there are factories in the syndicate.

9. Unless prevented by distance, communications, or other hinderances, the inspector shall be present every morning at some one factory, to receive the milk in company with the maker, and shall test samples of each patron's milk; he shall note the result of each test in a special memorandum-book, which shall be preserved and handed over to the association at the end of the season; the inspector shall always have with him on his journeys good instruments for testing milk, with which the syndicate shall provide him.

10. The test of the milk, its delivery in good condition, its manufacture, the general state of the factories, the accounts, shall receive the constant attention of the inspector, that nothing in any factory be neglected or allowed to remain in arrear.

11. The inspector shall receive from the association a special note-book, in which shall appear all the observations made in the course of his inspection; from it he shall extract and forward a *résumé* to the Inspector-General, or to any other officer who shall be indicated to him by the association, at the end of each season.

12. The inspector shall daily note down all his travelling expenses, and give in the details once a week to the secretary-treasurer of the syndicate: adding the list of factories visited, and indicating the probable route of his next week's journeys, in order that the secretary-treasurer may, if he desire it, communicate with him.

13. On pain of instant dismissal, the inspector shall communicate to nobody, unless it be to the Inspector-General or the secretary of the association, his observations on the factories and the work of the persons employed in them; still, he may, at the request of the proprietor, the maker, or the president of the directors of any factory, communicate to such persons the tenor of such notes of his as concern that factory.

14. In all cases, wherein he shall see need of making observations, either to the patrons in regard to the supplying of the milk, to the maker about his work, or to the proprietor about the fittings of his factory, the inspector shall first of all address the person in fault privately, by letter or otherwise; it is only after having ascertained the existence of serious neglect, or of evident evil intention, that the inspector shall warn the party or parties to whom the ascertained bad state of things will cause injury. In very serious cases, the inspector shall avail himself of the advice of the Inspector-General or of the officers of the association.

15. The inspector should be deeply impressed with the importance of the most guarded discretion, not only in regard to the foregoing cases, but in all the details of his duty; a serious infraction of this rule may be punished by the withdrawal of the certificate of competence granted by the board of examiners.

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## OF THE BOARD OF EXAMINERS.

1. The board of examiners shall be composed of three members and a secretary appointed by the board of directors at the annual convention, or about that time.

2. This board shall settle, and publish immediately, a programme of the examination to be passed by the candidates for the office of inspector to give them a right to a certificate of competence; it shall, at the same time, give the date and the place of the examination, and mention the references to be furnished by the candidates, and the other formalities to be gone through before admission.

3. To those who pass a sufficient examination the board shall give a certificate of competence; this may state the degree of success obtained—pretty well, or very well—and it shall be either provisional or definitive: the provisional certificate will be good for only one year, and the bearer may be called upon to pass another examination, either in all the subjects of the programme, or in certain specially reserved subjects.

4. The board of examiners shall without delay, make to the Honorable Commissioner of Agriculture and Colonisation a detailed report of the result of the examination, containing specially the names of the candidates and of those who shall have received the certificate, with the degree of success obtained.

5. Even the definitive certificate of competence may be withdrawn by the board of directors of the association from any inspector who shall be guilty of a serious breach of the rules, or who, for any other grave cause, shall be considered unfitted to discharge his duties properly.

6. If the number of candidates be not sufficient to warrant the holding of the examinations in more than one place, the association may, out of the funds allotted for the purposes of the syndicate, pay the half of the travelling expenses of the more distant candidates from their homes to the place of examination.

with the importance of the foregoing cases, and of this rule may be competence granted by

REPORT "IN EXTENSO"

— OF THE —

TENTH ANNUAL CONVENTION

— OF THE —

DAIRYMEN'S ASSOCIATION

HELD AT MONTMAGNY JANUARY 27TH AND 28TH, 1892.

WEDNESDAY, JANUARY, 27th, 1892, 2.30 P.M. : MR. BERNATCHEZ, THE PRESIDENT DECLARED  
THE CONVENTION OPENED.

FORMATION OF THE COMMITTEES.

M. J. C. Chapais, seconded by M. l'Abbé Montminy, proposed that Messrs. Lord, A. Chicoine and D. M. MacPherson, be appointed members of the Committee to examine the samples of salt-butter.—Carried.

M. Chicoine, seconded by M. Bernatchez, proposed, that Messrs. MacPherson, P. A. Fisher, and T. C. Cartier, form a Committee to examine the samples of silage.—Carried.

REPORT OF THE AUDITORS.

Messrs. Marchand and Fisher, auditors, presented their report, approving the accounts of the Secretary-treasurer.

Proposed by M. Chicoine, seconded by M. l'abbé Beaudry, that the conclusions of this report be approved. - Carried unanimously.

READING OF THE MINUTES.

The Secretary read the minutes of the last convention, which were adopted, and summed up the operations of the Association in a few words.

Mr. J. Adélard Caron gave a lecture on the Dairy-industry and the farmer : this lecture, as well as the discussion which ensued, will be found further on.

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## DISTRIBUTION OF THE DIPLOMAS TO THE INSPECTORS.

Mr. J. C. Chapais then announced that the diplomas granted to those who had passed their examinations at St. Hyacinthe in March, 1891, would now be distributed ; he entered into certain explanations as to the candidates, the ends pursued, the inspectors charged with the duty of discovering frauds, and, lastly, as to the examinations proposed for the makers or for those who intended to become inspectors.

Mr. Taché then distributed the diplomas to the following candidates :

As inspectors of creameries and cheese-factories :

MM. J. N. ALLARD, Warwick,  
D. U. BERNARD, St-Flavien de Lotbinière,  
NUMA BERNATCHEZ, St-Thomas de Montmagny,  
DELPHIS CHICOINE, St-Marc,  
SAÛL COTÉ St-Flavien de Lotbinière,  
P. E. MACCARTHY, Civ. Eng., Quebec,  
J. L. PAINCHAUD, Lingwick.

As inspectors of creameries :

MM. P. BONDESEN, Toronto,  
J. E. GAUDETTE, Ste-Marie Salomé.

As inspectors of cheese factories :

MM. A. E. DESAUTELS, Ste-Martine,  
P. O. DROUIN, Somerset,  
A. M. FERGUSON, Huntington,  
AUG. GÉRIN, Ste-Edwige de Clifton,  
C. C. McDONALD, MARTINTOWN (Ont.),  
JOHN A. McDONALD, Montreal,  
P. MCFARLANE, Huntingdon,  
WM. PARENT, St-Elphège,  
CH. POMERAT, Montreal,  
A. E. PHILLIPS, Russeltown,  
J. B. VIGNAULT, La Baie du Febvre,  
ROBERT WHERRY, Iroquois.

The presentation of each diploma was received with hearty applause.

The Secretary explained the value of the diplomas, and emphasised the fact that the evidence of one inspector carrying a diploma has proved sufficient to cause the condemnation by the magistrate of a farmer accused of fraud.

MR. COTÉ RETURNS THANKS.

*Mr. Côté.*—I believe I am echoing the words of all my diplomaed brethren here present in rising to offer, both in their name and in my own, our heartfelt thanks to the Association for the pleasure we feel in receiving our diplomas. We feel no regret at having worked as we have done; these diplomas will be a precious souvenir for us. For my part, I declare sincerely, that I am as proud of receiving mine, as a son of Æsculapius can be at receiving his diploma as a physician. If I have not the honor of hearing myself accosted as "Dr.," I can always say: "*je suis médecin.*"

*Mr Chapais.*—Rather a less dangerous profession too, it must be allowed!

*The President.*—They have the double advantage of exercising a profession less dangerous and, at the same time, less costly to the purse of their fellow citizens.

REMARKS OF THE PRESIDENT ON THE DIPLOMAS OF THE INSPECTORS AND THE FORMATION OF THE SYNDICATES.

*The President* congratulated the diplomaed candidates, who had passed their examinations successfully, and who are now qualified to teach the method of making a superior kind of cheese, one that will fetch the highest market price abroad. He added: This manufacture being new here, and its principles being, as yet, not thoroughly investigated, the association has delayed granting these diplomas, in order that the makers might acquire the necessary experience and become acquainted with the secrets of the trade.

The success obtained at these examinations by the candidates who presented themselves, are such as to leave no doubt as to their qualifications for their future work. With makers so competent as ours, I am thoroughly convinced that we can enter into successful competition in the dairy-business with any other nation in the world. All that remains to be done is the formation of syndicates. Several are at work in different districts, and the success that has there attended their efforts is a guarantee of their success here. I trust that the various factories of this part of the province will agree to form a syndicate which, under the superintendance of an inspector, shall cause our dairy-products, improved as they will then be, to obtain a still more remunerative price on our markets, and thus increase the riches and the prosperity of the farmers of this district.

(1) A pun on the words *je suis* I am, and *je suis*, I follow, *je suis mes desseins*, I follow my purposes. Trans.

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*M. J. de L. Taché*.—The absence of M. Auguste Dupuis obliges me to read a communication addressed by him to the Association, in his quality as Commissioner appointed by government to study, on the spot, the possibility of establishing a trade in butter with a country where the rays of the sun are powerful enough to cook eggs.

VILLAGE DES AULNAIS,

January, 15th 1892

J. DE L. TACHÉ, Esq.,

QUEBEC,

*My Dear Sir,*

Your letter of the 11th only reached me yesterday. I truly feel the kindness of your invitation to be present at the meeting of the Dairymen's Association at Montmagny, but I cannot accept the honour of being present, as we are all ill here.

Were I to go to the meeting, it would be rather with a view to acquire information than to afford it; for I candidly confess my ignorance of that industry so important to the agriculture of this province.

My report to the government contains, almost wholly, the information I derived about the dairy-trade, as regards milk, butter, and cheese, with Jamaica, the neighbouring Islands and Honduras.

The Hon. G. Joly de Lotbinière, I believe, will, if you wish it, send you the samples of condensed milk and packed (*en boîte*) butter I entrusted to his care.

I still have here a box of Dutch butter which I will send you by this post.

I saw, at the exhibition, some small cheeses, 3 or 4 pounds each, packed in stone jars. This mode of packing is highly approved of.

Retailers of cheese prefer those of 25 to 50 pounds, to large ones, of 60 to 70 pounds.

Condensed milk, made at Truro, Nova Scotia, was well known at Kingston Jamaica, before the exhibition, and was looked upon as equal to that made in Switzerland or Denmark. The exhibit of this milk was bought by a Kingston shop-keeper.

The butter in tin boxes, made in Manitoba by M. de la Borderie, St. Malo, Manitoba, reached the exhibition after the judges had given their decision, but the Superintendent, Mr. Dimock, praised its quality very highly.

The butter of Mr. Fisher, of Knowlton, P. Q., sent to Jamaica in tins, was as good as the Denmark butter; but that in glass jars was not so good; the India-rubber bands which held the tin-covers, having become softened by the effects of the salt and heat, allowed the air to enter to the deterioration of the butter. The preservation of butter in the Antilles

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is very difficult, the heat is very great all the year round, the houses have no cellars; they are built on piles, of brick or wood, 2 or 3 feet high, so that the air circulates underneath. It is easy to see how difficult it must be to keep butter in such houses without the aid of ice.

As I mentioned in my report, the cheese and butter of this Province were highly appreciated in Jamaica, and I related that our merchants (1), if they began this trade would make good sales there.

If they only sent the best quality of goods they would not fail to realise good profits. But commercial treaties have destroyed the prospect of extending our trade. The Americans have been beforehand with us.

In 1890, the United-States exported to the Antilles, Brazil, and South America, dairy-goods to the amount of \$1,066,156: Butter, \$764,902; cheese, \$229,354, and condensed milk, \$71,900. Of this, Cuba, Hayti and Brazil only took \$114,268. The States, through the treaties they have concluded with these countries, hope to increase their sales of dairy-goods considerably. I noticed a duty of 48% on United-States butter entering Brazil; in future it will only have to pay 23%. Canadian butter would have to pay the full duty of 48%.

United-States cheese and butter will enter Cuba free after July 1st 1892. Canadian butter will have to pay \$11.35 duty the 220 lbs., and Canadian cheese \$18.23 for the same weight.

In St. Domingo, Hayti, on Feb. 2st, 1892, there will be a reduction of 25% on the duties on butter, cheese and condensed milk, in favour of the United States alone.

In Jamaica, the customs duties on butter and cheese are 4 and 6 cents a pound. In accordance with the treaty between Jamaica and the States the duties will be abolished as regards the States alone.

These few notes will show the disadvantageous position Canada now occupies. In fact, the markets of Brazil, and the English and Spanish Antilles (West India Islands) are closed to Canadian dairy-goods.

The Dairymen's Association of this province will doubtless employ its great influence to persuade the federal government to take measures to win from these different countries the advantages granted to the products of the United-States.

Forgive me for having dared to send you such carelessly written notes; I had to put down these disconnected phrases in a great hurry.

Hoping that your important association will continue in the path of progress that has distinguished it since its organisation, I remain,

Your obedient servant,

AUG. DUPUIS.

(1) *Negociant-merchant*; *Marchand-shopkeeper*. In Scotland, owing to her long friendship with France, during the wars between France and England in the 15th and 16th centuries, many French words have been retained, notably, *Merchant*, where the English would say *Shopkeeper*: Trans.

J. DE L. TAC

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J. DE L. TACHÉ, Esq.

SECRETARY OF THE DAIRYMEN'S ASSOCIATION, MONTMAGNY.

DEAR SIR,

It is impossible for me to be present at the meeting of the Association, to obtain information concerning that important industry which occupies the attention of the distinguished members of the Dairymen's Association. I take the liberty of asking you a few questions, which will display my ignorance on the most elementary part of the subject. Still, I trust that the Association will reply to them, for the sake of a number of farmers who are as ignorant on the subject as I am, and whom I have heard ask the very same questions. (1)

I see with pleasure that the Imperial Government has notified the Canadian Government that the English and Spanish West-India Islands will admit the productions of Canada on the same conditions as the productions of the United-States. This will be of great advantage to our country, as it will aid in the development of the trade in milk, cheese, and butter with these Islands, where there used to be customs' duties of from 25 to 48 %.

Mr. Adam Brown, ex-commissioner of Canada to Jamaica, who interests himself greatly in the promotion of our trade with the Antilles, announced this good news in the *Hamilton Spectator*, a copy of which I enclose.

Hoping that your meeting will be as fruitful of good to the public as the noble efforts of the Association deserve, I remain,

With respect,

Your obedient servant,

AUG. DUPUIS.

St. Roch des Aulnais, January 27th, 1892.

(Extract from the "Hamilton Daily Spectator", of January 21st, 1882.)

"TRADE WITH THE WEST INDIES."

The readers of the *Spectator* will remember that the United-States recently concluded a treaty of commercial reciprocity with Jamaica and other West-India Islands. In virtue of this treaty, the Islands admit free

(1) The reading of these questions was postponed to the end of the first session and gave rise to the discussion that, with the questions themselves, will be found further on.

of duty or at very slight rates, a long list of articles, chiefly provisions, the production (American) of the United-States. The question immediately arose whether the same articles, the production of Canada, would be admitted at the tariff granted to the United-States. This point was submitted to Mr. Adam Brown, who is thoroughly acquainted with the West-India trade, and his opinion was that Canada would enjoy the privileges granted to the Republic of the United-States.

It is certain that this affair had already attracted the attention of the federal Ministry, and that they had communicated on the subject with the Imperial authorities, and probably with the local authorities of the West-Indies as well. It would seem that the position taken by Mr. Brown was identical with that taken by our financial Minister, and it appears that, now, the Imperial authorities take the same view of the matter. A despatch from Ottawa asserts that the Imperial authorities take it for granted that Canadian goods will be admitted into the West-Indies at the same rates as the goods from the United-States, or in other words: the Islands will not impose any differential tariff on goods from the Dominion. This would seem to settle the question entirely.

It is a point of the greatest importance to Canada. The West-Indies consume an immense quantity of provisions: flour, bacon, fish, butter, lard, and many other articles that Canada can supply them with of better quality than the United-States can furnish, and certainly at a cheaper rate. The opening of a trade with the English West-Indies would be the signal for the increase of our trade with the rest of the Antilles and with the South-American States. When once a new market is opened to commerce, no one can estimate the importance of the rush of traffic that will pour into it.

The present existing treaties assure Canada, on the part of the English and Spanish Antilles, the same treatment as is granted to the United-States.

But the treaty with Spain expires on the 1st July, 1892; the federal authorities are negotiating for a renewal of the treaty, and hope to obtain it. Should they fail, our products would be less advantageously treated than those of the United States.

The Secretary then read the following extracts from Mr. Dupuis' report.

#### EXTRACTS FROM THE REPORT OF MR. DUPUIS.

As the intense heat prevented the butter and cheese from being displayed in the open air, the Hon. Commissioner of Canada had judges appointed to examine them. In the presence of His Excellency, the

Governor, and of the Messrs. Ashenheim, L.

Mr. Brown explained the factories in Canada, and He told of the enormous quantities of cheese exported to England. "This cheese has been made at the factory" it left the factory."

When the judges examined the cheese exhibited was really magnificent. My exhibit, it is really with Canadian flour, as highly. (1)

The prizes were as

#### PRIZES.

- 1.—ISAAC WENGE
- 2.—AGRICULTURAL
- 3.—BELL, SIMPSON
- 4.—do do

- 1.—DUCKETT, HODGSON
- 2.—L. C. ARCHIBALD
- 3.—HODGSON BROTHERS
- 4.—P. W. FEARMAJ

Out of four prizes offered off three, that is:

The Agricultural school  
The St. Eustache creamery  
The Eastern Townships  
Messrs. Bell, Simpson

(1) *Petits pains* the American means. Trans.



Governor, and of the Commissioners of the different counties (*provinces*) Messrs. Ashenheim, Lewis, and Benson, the judges, began the examination.

Mr. Brown explained that the cheese came from 30 to 40 different factories in Canada, and that it had been selected by Professor Robertson. He told of the enormous quantity of this cheese that was annually exported to England and the Antilles, and showed how well it kept. "This cheese has been 56 days on its passage, and it is as fresh as the day it left the factory"

When the judges had finished their examination, they stated that the cheese exhibited was *very* fair, good in quality, and that the butter was really magnificent. Mr. Ashenheim added: "You ought to be proud of your exhibit, it is really splendid." His Excellency tasted the rolls, made with Canadian flour, as well as the butter, cheese, &c., and praised them highly. (1)

The prizes were assigned as follows :

#### B U T T E R .

##### PRIZES.

- 1.—ISAAC WENGER, Ayton, Ont.
- 2.—AGRICULTURAL SCHOOL, l'Assomption, Province of Quebec.
- 3.—BELL, SIMPSON & CO., Montreal: exhibited by the Department of Agriculture, Ottawa.
- 4.—do do do Montreal: exhibited by the Department of Agriculture, Ottawa

#### C H E E S E .

- 1.—DUCKETT, HODGE & Co., Montreal: exhibited by the Department of Agriculture, Ottawa.
- 2.—L. C. ARCHIBALD, Antigonish, N. S.
- 3.—HODGSON BROTHERS, Montreal: exhibited by the Department of Agriculture, Ottawa.
- 4.—P. W. FEARMAN, Hamilton, Ont.

Out of four prizes offered for butter, the Province of Quebec, carried off three, that is :

The Agricultural school at l'Assomption.

The St. Eustache creamery: sold to Bell, Simpson & Co.

The Eastern Townships creamery: sold to Bell, Simpson & Co.

Messrs. Bell, Simpson & Co. inform me, in the letter attached, that

(1) *Petits pains* the Americans persist in calling "biscuits", which they are not by any means. Trans.

their exhibit came from the above named creameries. As to the cheese, the first and third prizes were assigned to cheese bought of two Montreal firms.

These results ought to be satisfactory to the government and people of the Province.

Mr. Fisher, of Knowlton, had entrusted to me a box of butter, made in November, and carefully put up in glass jars and small tins. It was a very fine exhibit, but the butter was thought to be a little soft. Those who like Danish butter, packed in tin boxes, would not have found any difference in the two kinds.

The Canadian butter and cheese were sold by auction: the butter fetched thirty-two, thirty-six, and forty-two cents a pound; the cheese, eighteen to twenty-five cents.

The shopkeepers, who bought the butter, advertised in the morning-papers: "Choice butter! Prize Canadian butter, 50 cents a pound." The second quality was retailed at 36 to 40 cents a pound. In a very short time, the butter was all sold, and the shopkeepers wanted to know if we expected any more of it.

Mr. Tozer, of the firm of Pennock, Bailey & Co., told me that his customers were asking for Canadian butter, and that he could sell a great deal of it, provided it were of the best quality, such as that we had exhibited.

The above firm imports a great quantity of butter from the United-States in wooden tubs twice as thick as those we use here; these tubs hold as much as 150 lbs., each. It is good cooking butter, and costs the firm 20 to 22 cents a pound. I fancy it is what is called "Western" butter in New-York. A great deal of oleomargarine is sold in Kingston at 25 cents a pound; it is consumed by the poorer class.

The butter that was the most in request before the arrival of the Canadian, was that of Denmark and Holland, which is imported from England and the States. It is packed in tins, holding from half a pound to five pounds, and hermetically sealed. I could not find out its cost price delivered in Jamaica, but it retails at Kingston at 55 cents a pound. I bought a few tins of it for our government, which will, I am sure exhibit it and show those interested its quality, and the mode in which this renowned butter is packed; so that the makers of the province may become acquainted with this system of preparation which is the most profitable for exportation to the Antilles and to South America.

I learned that the small tins only cost from  $1\frac{1}{2}$  to  $2\frac{1}{2}$  dollars the hundred, and the machine for making them costs \$150.

A butterman at Kingston told me that butter, packed in this way, must be of the best quality, and that it should only be allowed to be put into the tins under the inspection of an officer of the government who thoroughly understands the butter business. He added, that a company at Cincinnati,

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Ohio, had begun to furnish Jamaica with butter in tins, but it was such a mixture of good and bad and so wanting in uniformity of quality, that the company had completely lost all sale for it at Kingston.

Some citizens of Hayti, who had come to Jamaica for the exhibition, and were delighted at visiting the department of the province of Quebec, since they found there people who spoke French as they did, told us that Hayti was richer than Jamaica, and that the productions of our province, when once known, would meet with appreciation there and be largely in demand; that the line of steamers, projected to be run between Canada and Jamaica, could stop at Hayti, and land their goods, just as is done by the steamers of the Atlas line.

At Hayti, they said, the butters of France and Denmark are preferred; the air does not injure them in the small tins, and there is no loss in weight to the retailers; while, in tubs, butter loses both weight and quality through the effects of air and the intense heat of the climate.

I regretted very much at that time not to have succeeded in getting ready some keeping butter before I left Canada for Jamaica; for I could have sent some to Hayti, Honduras and Trinidad.

Mr. Fisher, who had come to Jamaica from Honduras to engage 300 laborers for his extensive plantations: the same gentleman bought furs from Mr. Laliberté, of Quebec: found the l'Assomption butter excellent, and told me such butter would fetch a very high price at Honduras and throughout the whole of Central America. Unfortunately, I had not a sample of butter that would keep to give him.

On the 26th of October last, I wrote to Mr. McCarthy on this subject, and in reply to my request that he would prepare some butter, such as the French send to Algeria, for exportation to Jamaica, I received a letter from him, the most important passages of which I will quote: after having expressed his regret at not having any such butter to send me, he added:

"As Canada has not yet, as far as I know, prepared any butter especially for the colonies, it may not be perhaps unnecessary for me to tell you how very much this preparation differs from the ordinary method of making butter. Besides, this butter must be packed in glass jars, or in metal boxes hermetically sealed, just as preserved fruits, &c, are treated. Butter sent to the colonies in ordinary packages would not give satisfaction.

Not only would a sample of butter packed in a tub fail to answer your purpose, but it would do more harm than good, and would compromise the success of our future exports to the colonies. There is a great trade to be created here; but, and we must note this well, the French and Danish butters for exportation to the colonies are made after a fashion unknown here, and outside which there is no possible chance of succeeding."

We must not neglect Mr. McCarthy's warnings: they deserve to be taken into our serious consideration.

*Cheese.*—The method of making and packing cheese practised in Canada is as perfect as the method followed in the other countries that send cheese to Jamaica. Canadian cheese was even judged to be superior in quality to the other kinds

*New-milk* was selling in Kingston, during the exhibition, at 75 cents a gallon. An English company, that was making butter on the exhibition grounds, found the milk very poor; for the cows there have no timothy and clover pastures, as in Canada; they are fed on *Guinea-grass*, dried weeds, the leaves of trees and of dwarf palms; in consequence of which, the Jamaicans use a vast quantity of condensed milk that comes from Switzerland, via England and the States, as do the inhabitants of Hayti, and the Antilles. It is this milk that is used on the lines of steamers, and on sailing ships in all parts of the world. The retail price of it at Kingston in tins of various sizes, is 12½ cents a pound.

Though I do not know the exact profits made by the Swiss and French farmers out of the manufacture of condensed milk, it seems to me that the province of Quebec might compete successfully with them, as milk is dearer in their country than in ours.

*Mr. S. A. Fisher.*—I observed, in the *Journal d'Agriculture*, that Mr. Bernatchez had sent 1,000 tins of butter to Jamaica. Would the President give us the results of this consignment?

*The President.*—It is a mistake.

*Mr. Barnard.*—I did not mention M. Bernatchez's name in the *Journal*. I stated that the consignment was sent from St. Thomas.

*The Secretary* gave details as to the manner of opening and closing the tins used for the exportation of keeping butter, and on their manufacture by different European firms. He exhibited before the meeting 7 sizes of tins used nowadays for the exportation of butter, and explained the way of making them. The round (*pourtour*) and the top of the tin are made beforehand; then, after having filled in the butter, the bottom, which is bevelled at the side, is put on. Between the side of the tin and this bottom, a small band of india-rubber is inserted, placed in a circular groove in the bottom, so that the tin, after the bevel is closed, becomes perfectly air-tight. The tin is opened by turning a key inserted at a point in the round of the cover (just as in the case of a tin of sardines). These tins hold from ½lb to about 4½lb. (1).

*Mr. Fisher.*—We have received a certain number of sample tins from a Montreal firm, only there are no india-rubber bands sent with them.

(1) Our readers will find information about these packages in Mr. MacCarthy's report at the end of this volume.

*Mr. President*

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## LECTURE BY M. L'ABBE BEAUDRY

## THE DAIRY INDUSTRY IN MANITOBA.

*Mr. President and Gentlemen.*

This is the second time I have visited St. Thomas de Montmagny, and I hope, for my own sake, it will not be the last. For I have not forgotten the extreme kindness and cordiality with which I was greeted, two years ago, on the part of the Agricultural society of the county, and in particular by its working president, M. Ph. Landry, when I came here to exhibit the farm products of Manitoba.

As a member of the Dairymen's Association, too, I felt bound to be present at this meeting, with a view of gaining instruction, but also that I might attest by my presence the interest I take in the association, on account of the immense good it has already done, and the still greater good it will do for the advancement of agriculture in the province of Quebec. But how was I surprised, when the Secretary invited me, last week, to address the meeting on THE DAIRY INDUSTRY in *Manitoba!* That is what I am about to do. Still, that I may be well understood, you will permit me, first of all, to give you some notion of the *topography*, the *soil*, and the climate of Manitoba, in order to show you the immense development open to the dairy industry in that province, and to describe the progress made during the last five years.

## TOPOGRAPHY.

The province of Manitoba entered the Canadian Confederation in 1870; it is comprised between the 48th. and 53rd. degrees of N latitude, and the 95th. and 101st. degrees of W. long. It forms a square of about 300 miles a side, with a superficies of 60 millions of cultivable acres. It is in the very heart of the Dominion. Winnipeg, its capital, being 1423 miles from Montreal, and 1483 miles from the Pacific.

Being in the same latitude as Paris, South-Germany, and the grain-growing countries of Europe, it is not at all surprising that Manitoba has risen to the first rank in wheat-growing countries, and it is this that tended towards its marvellous development, as soon as its soil was rendered accessible to colonists.

Up to 1872, it was extremely difficult for an immigrant to take his family there; the journey was laborious, and occupied four weeks. At that time, easier means of communication were established, and the length of the journey diminished by one-half. It was then that the illustrious Archbishop of St. Boniface, Mgr Taché, invited our compatriots to take possession of their share of this fertile country. Still, a journey of 12 or 15 days, partly in boats, partly in ox-carts, was a hinderance to moving one's family. Thus, immigration never became really considerable until

1882, when the first railroad was built, and especially when the C. P. R., was opened for traffic in 1886. The population of 19,000 in 1871 increased in to 65,000 1882, and is now nearly 200,000.

The town of Winnipeg is now no longer a trading-post, a simple village; it is a modern town, well built, with wide streets, well paved, and lighted by electricity, containing a population that will soon amount to 30,000. Eleven lines of railroads, now in operation or under construction, enter the town. During the last ten years, the country has been covered with a net-work of railroads, 1,500 miles long. The fact that more than 50% of the cheese and butter factories lie within a radius, of, at most, sixty miles of Winnipeg, shows how great a development may be anticipated for the young capital, and what an advantageous distributing market it will be for dairy-goods.

### THE SOIL OF MANITOBA

Is acknowledged to be the most fertile in America. Mr. Blodgett, an American, once said: "The soil of the Winnipeg basin is the most favorable to the growing of wheat on this continent, and probably in the whole world." The American Consul, Mr. Taylor, who perhaps knows Western America better than any man alive, once stated that the best wheat-lands lie to the North of the United States, that is, in Manitoba; and events have proved the truth of their assertions. This year, according to the official bulletin, the wheat-crop of Manitoba alone is, in round numbers, 23,000,000 bushels; oats, 14,000,000; and Barley, 3,000,000. Now, a country so productive of grain cannot be unsuited to the dairy-industry.

Besides, from their geological formation, it is clear that the valleys of the Red River and the Assiniboine were formerly covered by the waters of Lake Winnipeg, which, on retiring, left a deposit of black, inexhaustible alluvium, from one foot to six feet deep. Manitoba is called "The Prairie Province," but there was a time when it was covered with forests of oak, elm, and maple.

The fires, carelessly caused by the Indians, mowed down these forests, and left in their place a sea of verdure, of nutritious hay, of grass of all sorts, fifty species of which are suited to the consumption of cattle. Among the best are: wild vetches, wild pease, *Scotch grass*, *buffalo grass*, sheep's fescue. Timothy, alsike-clover, white *melilot*, are met with here and there and do well, when properly treated, as may be seen by the sample of timothy I have here.

The soil, rich in pasturage, is incomparable for the growth of vegetables; potatoes, carrots, turnips, cabbages, all grow to an immense size.

At the last Winnipeg exhibition, in September, 1891, the Rev. Mr. Hugonard showed a common cabbage weighing 61 lbs. (Applause). You must acknowledge that such a cabbage would be an awkward travelling companion; so I have brought with me, as a witness to the fertility of

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the soil, in place of the cabbage, two samples which grew at Fort Alexander, Man. The timothy measures FIVE FEET TEN INCHES in height, and the bunch of oats, SIX FEET SIX INCHES. Is that as good as the cabbage? Yes! yes!! (Applause).

Well, I proceed: Now the root-crop, bearing so large a part in the success of the dairy industry, it is clear that the Manitoba farmer has every facility for making good butter at a cheap rate. Add to this, bran at \$8 to \$10 a ton, the refuse of flour-mills, of the linseed-oil mills, &c., and you see that there is plenty of choice cattle-food ready to ensure the success of the dairy-industry.

#### THE CLIMATE OF MANITOBA.

The dryness of the atmosphere, the coolness of the nights in summer, a wintering that rarely exceeds four months, and sometimes falls short of it; all this is highly favourable to the rearing of cattle, and especially to the dairy industry. (1) The great breeders of St. Eustache only stable two milk-cows, and winter the rest of their herd in the bush.

#### THE COWS OF THE COUNTRY.

Before talking of the dairy-industry, it would, I think, be as well to say something about the cows of the country. If I remember rightly, the first were imported from Minnesota, about 50 years ago. At present, it would be difficult to assign them to a definite type; they are a mixed lot, varied to infinity, in which it seems as if one could recognise the characteristics of some of the improved breeds imported about ten years ago. The color of the hide varies a good deal; all shades are represented. From the richness of the pastures, they are generally strongly built, with wide loins and well developed hind-quarters. A practical breeder told me that, when well cared for and treated as cows are in Lower Canada, that is, milked regularly and not only two on three times a week, they make good cows and are hardy. Some of them are capital milkers, but they all give a quality of milk the richness of which surprises strangers.

M. Chs. Mignault told me, in 1887, that the average yield of butter for that year was 5 pounds for 100 lbs of milk. (20 lbs of milk to the pound of butter! Trans.)

M. S. M. Barré published the report for the whole season of manufacture at St. Pierre, Rat-river, for the year 1890. Now, that year, the cattle left their winter quarters in very poor condition, and, in consequence of the abundance of rain, the grass grew very rapidly, which caused it to contain a less percentage of matters that enrich milk in butter than usual. Well, in spite of these drawbacks, the following results were obtained. The herds are composed exclusively of the cows of the country:

(1). *Hivernement*, &c., of course means that the cattle need only be kept in winter quarters for four months. Trans.

Pounds of milk received....	88,982	257,203	212,784	198,859	144,273	42,001
Pounds of butter.....	3,599	11,098	10,004	8,919	8,032	2,430
Pounds of milk to the pound of butter.....	24.72	23.17	21.19	20.25	17.96	17.28
Total milk received.....	944,102	Average of pounds of milk to the pound of butter during the whole season. } 20.99 (1)				
“ butter made.....	44,974					

Pounds of butter to the 100 lbs. of milk 4.76.

In a report from Governor Hoar, published in the “Country Gentleman,” of the 21st January 1892, the average yield of butter from the 100lbs of milk at the Fort Atkinson creamery, Wisconsin, during the four years 1887, '88, '89 and '90, was 4.09.

Mr. Barré added that this percentage of butter, 4.76 for Manitoba, is higher than those which follows, namely, 4.25 for Quebec, 4.00 for the United States, 3.75 for Ontario, and 3.50 for Europe.”

#### THE FIRST CREAMERY.

In spite of the advantages offered by the country: free, unlimited pastures, full of the most nutritious grasses, easy mode of communication, &c., there was, up to 1886, no such thing known as a creamery or cheese-factory on the co-operative plan, except the private cheese-factories: other attempts had ended in failures. Then, the Hon. A. A. C. LaRivière, prime-minister of Manitoba, requested M. S. M. Barré to give lectures in the chief towns, especially in the French-Canadian parishes. The lecturer was so favorably impressed, that he decided to build a model creamery, and to introduce the Danish separators. He entrusted the care of this establishment to his brother-in-law, M. Chas. Migneault, a skilful mechanic and a capital butter maker. The same year, 1887, M. G. Caron, of St. Charles, opened a co-operative creamery, with a Laval separator, and our two compatriots were striving to beat the Ontario men on their own ground! At the general exhibition at Toronto, M. Caron took the first prize and M. Barré the second; at the provincial show at Ottawa, M. Barré took the first prize. Thanks to our compatriots, the reputation of Manitoba butter was made, both in Ontario and on the British Columbia market. The example was set, and it was followed up.

In 1888, M. Dosithé Pelletier, of La Présentation, P.Q., erected three fine cheese-factories of the best kind; two at Lorette, the other at St. Jean Baptiste. For his part, M. Barré did not go to sleep on his success; in the spring of 1888, he opened four cheese-factories: at St. Anne, St. Norbert, Royal, and at St. Agathe; and in 1890, he started another model creamery, at Otterburn.

In short, we find that by the opening of 1888, three separate creameries and nineteen cheese-factories were in operation. In the spring of 1891, there were 25 cheese-factories and 11 creameries.

(1) The average of an English dairy-cow on good pasture, and nothing but hay (meadow) in winter, is 25 lbs of milk to the lb of butter. Trans.

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The movement started in the Canadian parishes made its way into English districts. Dr. Barnardo's creamery at Russell, is renowned throughout Manitoba. Though 222 miles from Winnipeg, its products are sent every week to the epicures of the capital. This creamery is managed by an experienced Dane.

I should not be doing justice to the dairy-work of Manitoba, were I to omit mentioning the establishment of M. de LaBorderie at St. Malo. This gentleman arrived there in 1887, and two years later he organised a creamery, which has since been greatly improved. The fitting up of it was entrusted to M. G. Henri, a distinguished engineer, former pupil of the Ecole Centrale of Paris

After several trials, M. Henri returned to Paris and worked under M. Duclos, professor at the Institut Agonomique, an authority throughout Europe on dairy matters. Under this distinguished savant, M. Henri acquired some valuable pieces of information, which enabled him, by a special mode of treatment, to ensure perfect preservation of his products.

It had always been a dream of M. de LaBorderie to make butter for Japan and other hot countries. In the spring of 1891, M. Henri returned from Paris with the most perfect machinery, and with tins capable of being closed hermetically, in which M. Henri can send out his splendid butter and need not fear competition with the best Danish and Norman makers. To him is due the honor of being the first man in Canada to pack keeping butter for distant markets. A description of this model establishment appeared in the *Colonisateur Canadien* of the 1st. October. "The first room is appropriated to the motive-power. In the next, is a Burmeister & Wain separator, of great capacity, and the vats for the reception of milk and cream, as well as the churn and refrigerator, which latter is on a new model. Such is the methodic way in which this room is fitted up, that the manual labour is reduced to a mere nothing, the milk delivered passes through the separator ; the skim milk falling into a vessel, while the cream passes over the refrigerator into its own vat. This refrigerator, which is driven by steam, is the invention of M. Gabriel Henri, and lowers the temperature of the milk to the requisite point with great rapidity

"The cream, after ripening, is introduced automatically into the churn, leaving it in the form of butter, which is then taken into the next room."

"In this third room the temperature is always kept equal ; in it is the presser, and here the butter receives the preparation that fits it for the market. For local consumption, the butter is packed in tubs ; for export, it is packed in tins of from one to two pounds, just as fruit and vegetables are treated. The closing of the tins, however, is peculiar, and requires no soldering, which has always been the great difficulty ; the tins are closed by the beveller [*sertisseur*], which machine is kept in this room. By following out this system of tins, the butter is preserved for an indefinite time, and can be profitably exported to distant markets and hot countries."

M. de la Borderie's success is now assured, and no doubt about it remains. Samples sent to the Jamaica Exhibition have earned the gold medal and the diploma of honor." A like diploma was awarded to M. de la Borderie at the Winnipeg show last fall, while Messrs. Barré and Migneault carried off the two first prizes. Here, Mr. President, is one of the tins spoken of, like the sample to which a prize was given in Jamaica. It was sent me through The Revd M. Joly, curé of St. Pierre. I received it yesterday by post, the butter being in a liquid state, as the mail-bag had been put on a stove; the same mischance befell it last night, as the porter of the sleeping-car, unknown to me, had put it close to the hot-water-pipe. You can examine the butter itself, and the way in which the tin is sealed.

As you see, gentlemen, the tins are closed at the bottom. First of all, the cover is fastened by a soldered band, then a piece of muslin is placed above and below the butter and the machine [*sertisseur*] is applied to the tin. The first consignment cost 3 cts a tin; but the *Western Farmer* states that the two lbs tin costs 6 cts. There can be no doubt that making them at home will considerably lower the cost. M. de la Borderie has already sent 500 lbs of this butter to Messrs. Crawford & Co., San Francisco, and he has many more orders than he can fulfil. Messrs. Grant, Home and Bucknall, of Winnipeg, have bought up in advance the whole make of this creamery for next season.

At first starting, M. de la Borderie used to make butter for his patrons at the ordinary charge of 5 cts a pound; now, he buys the cream at 50, 60, 75cts the 100 lbs of milk, according to the season. The patrons carry back the skim-milk. The same system is practised at St. Eustache.

#### MARKET.

The products of the dairy are sold at a profitable rate on the local market, and in British Columbia. Both cheese and creamery-butter sell higher there than at St. Hyacinthe. (Manitoba.)

#### PROFITS.

To the profits realized by the dairy industry, properly so called, must be added the rearing of calves, which costs nothing, and the fattening of hogs which increases *pari passu* with the extension of dairying. In 1887, there were 35,713 swine; in '89 the number had risen to 51,657, i. e., an increase of 15,944 in two years. There are certainly twice as many now, for the demand is considerable and the price encouraging.

Our calculations are now easily made. If, in the Province of Quebec, dairying pays on farms worth \$50 and more an arpent, it ought to pay still better where pasture is free and gratuitous. The bulletin No 29 of the Department of Agriculture of Manitoba gives the number of milch-cows as 75,968, and there is hay enough wasted every year to feed ten times that number.

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#### DISCUSSION

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What is wanting is capital to buy stock to eat the food that goes to waste every season. The parish of St. Hyacinthe, at the very gates of Winnipeg, with easy communication by rail for the delivery of milk at Winnipeg, could feed 10,000 cows; and there are not 1,000. There, is a field open to men of enterprise!

Of the six districts, however, it is in the Eastern one, where are situated the Canadian parishes, that the cows are most numerous: 27,122, which is double the number in the South-central district, where are the largest Mennonite villages, with 13,050 cows: the two together keep more cows than the four other districts combined.

At present, although our nationalists [*nationaux*] represent no more than one-seventh of the whole population, they own 43 % of the creameries and cheeseries of Manitoba and the North-West, and 46 % of the capital employed in the dairy-industry. At the last exhibition at Winnipeg, they carried off the three first prizes, and showed themselves to be worthy rivals of their brethren in the Province of Quebec. This very day, a meeting of the Manitoba Association, is being held when M. Barré is to read an important essay. This shows that we are working in concert, and casting our eyes on the Dairymen's Association of the province of Quebec which is before us.

Thanks, Mr. President and Gentlemen for your kind attention. I have abused your patience; as a punishment I invite you to come and prove the facts yourselves in Manitoba next summer. I will make it a duty to accompany you. [Applause]

*The President* :—In the course of his interesting lecture, M. Beaudry told us of a common cabbage that weighed 61 lbs. Here, we should call that an *uncommon* cabbage

*M. Chapuis* :—He meant that the cabbage was one of a common sort, not that the weight was a common one.

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#### DISCUSSION ON THE AGRICULTURAL CLUBS AND THEIR ORGANISATION INTO SYNDICATES.

*Mr. Barnard* —It appears, Mr. President, from the documents that the lecturer has just communicated to us, that we have, among our brothers in the sister-province, men who are by no means inferior to ourselves. Doubtless they possess certain advantages that we have not, especially as regards the rearing of cattle, which they can carry out on a great scale. The immense prairies that surround them offer abundant means of support to their herds at all seasons of the year, without any cost of cultivation. Transport is easy; the great C. P. R. places them within easy reach of our best markets, and Manitoba now sends her butter to our chief exhibitions, where it takes the first prizes. Manitoba bears the reputation of

making the best butter in Canada. We have a strong competitor to contend with, if we do not mean to allow all the profits to go thither. One means of assisting agriculture in this part of the province, a means to which M l'abbé Montminy has devoted all the energy he possesses, is the creation of agricultural clubs, destined to instruct our farmers in the methods they should pursue to increase their profits and improve their position, by enabling them to profit by the experience of others. These clubs, when once established, if men of earnest purpose do not allow themselves to be discouraged, will yield the same beneficial results that they are now producing in the places where they exist at present. I will say no more on this question. We have here, present among us, M. Bourbeau, who has been wise enough to profit by the instruction given by the Dairymen's Association and has induced the farmers of his county to profit by them as well.

If he had not attended your conventions, he would perhaps never have thought of founding an agricultural club. He listened to your addresses, he saw that there was a possibility of doing a great service to farmers; he established a farmers' club, which is now in a flourishing condition; he built a cheese-factory, built and persuaded others to build siloes, and here he is, at the end of 18 months, writing essays in the *Journal d'Agriculture*; and, only the other day, I received from the secretary of the club a report showing the progress that had been brought about in the district by the pains taken by the farmers' club.

*M. Bourbeau* :—Mr. President, and Gentlemen, I feel flattered by the remarks made by Mr Barnard in our favour. As he related, we have profited by the advantages which were offered us, when you, Mr. President, and several other lecturers visited us, in order to teach our farmers how to cultivate the land with the aid of science and of the principles acquired by practice and study. I did not expect, when I attended as a simple listener the first meeting held in our town, to become an assiduous member of your conventions, and to find myself converted into a farmer; not that I pretend to be a finished farmer: I am still in my apprenticeship. It is from that meeting at Arthabaska that the farmers' club of which I am president dates its establishment.

After having listened to the interesting discussions at your meetings; after noting the chief facts that were to be gathered from your lectures; I begged our Curé to give me an opportunity of stating to the people the useful instructions that I had gathered at the conventions; and I communicated to them though less skilfully than the original speakers, the purport of the different lectures I had heard. We established this club, which has worked wonderfully well, thanks to the earnestness of all the members; three siloes have been built; they have all been successful, and by the use of silage, the most economical of all foods, we have been enabled to increase the numbers of our herds.

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Another mode of economising cattle-food is by fermenting the fodder. With a chaff-cutter, the hay and straw are cut up, put into large bins, and sprinkled with water. The whole ferments, and the cattle receive their food in a warm condition that gives it a double nutritive value.

Two hours' work is enough to prepare the food with the chaff-cutter for 20 head of cattle for one week. When once prepared, this food is more easily served to the cattle than the same food in its ordinary state. More than that : I am sure that, with 20 head of cattle to feed, I save 50 bundles of fodder a week. I beg the meeting to excuse me, Mr. President, if I linger over these details, which are practised with us, and which doubtless are well known and improved upon here. I know your farms are richer and of better quality than ours. Still, however rich the soil may be, if we do not restore to it what has been carried off by an exhaustive cropping with grain, it will become impoverished, and will not repay the cost of cultivation. I cannot but recommend, in conclusion, the formation of farmers' clubs in these fine parishes, whither you all, brother farmers, may come to imbibe the instruction so necessary to improvement and progress. I have reason to believe that you will appreciate the advantage of having heard the lectures delivered at this meeting, that you will follow the example given elsewhere, and that you will push forward the formation of a club that will not be a failure. In my opinion, it would be a good thing to form a grand syndicate of Agricultural Clubs, with Quebec as the centre, the aim of which should be to assist the country clubs by sending them the lecturers required to enable them to exercise a useful influence. These clubs are not always so well patronised as we have a right to expect ; there is a certain apathy common among farmers ; they are seldom present at the meetings ; they do not attend the sessions ; and this is all the more regrettable, since the clubs offer the means of intercommunicating any fortunate results obtained, as well as any mischance that has been met with ; those who have been successful may cause those of their friends who may be in a position to receive the information to benefit by it : mischances frequently bear with them lessons of salutary effect.

As a corollary of the preceding remarks, M. Bourbeau, seconded by M. Montminy and Mr. S. Fisher, submitted the following motion to the vote of the meeting.

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#### MOTION IN FAVOUR OF THE CREATION OF A SYNDICATE OF THE AGRICULTURAL CLUBS OF THE PROVINCE OF QUEBEC.

Seeing the indisputable benefit that results from the principle of association ; seeing the need of aid and protection under which many agricultural clubs, and other associations of a like nature, labour ;

Seeing the advantage of obtaining information of general utility to the agriculture of this country in its various branches, and to communicate such information, by means of publicity, to those interested ;

It is resolved that a committee, composed of the Rev. M. Montminy, vice-president of the association ; Messrs. S. A. Fisher, member of the Council of Agriculture of this province ; J. C. Chapais, assistant-commissioner of the dairy industry of the Dominion ; D. C. Bourbeau, president of the Victoriaville agricultural club ; Dr. Bruneau, of Sorel, director of this association ; Philippe Landry, president of the agricultural society of Montmagny ; and Ed. Barnard, secretary of the Council of Agriculture, and director of the official Journals of Agriculture of Quebec ; be requested to study thoroughly a project for establishing a syndicate of farmers of this province, and, if they think proper, to take the necessary means for its creation. [Carried unanimously.]

*Mr. Barnard.*—Mr. Fisher has kindly seconded M. Bourbeau's motion ; although he is not a French Canadian, he always has the interests of this province at heart. As he has been engaged in the organisation of farmers' clubs, he will be able to assist us in the discussion of the best means of forming this syndicate. Although he does not speak French with the same ease with which he speaks English, he knows how to make himself understood, and we may be sure that his words are based on information acquired by study and practice.

*Mr. Fisher.*—If it is not easy for me to speak French colloquially, it is still more difficult to speak it before such a meeting as this, but I have the interests of the Dairymen's Association so thoroughly at heart, that I feel a pleasure in saying a few words to this convention. I have examined many farms belonging to French-Canadians, and among them I found many things that might teach a lesson to the English of this province. M. Bourbeau's motion is conceived in the interest of the province. I am convinced that by the principle of association we shall get on more rapidly. We have plenty of creameries and cheeseries ; each factory ought to be the centre of an agricultural club, where the members may meet to study together the best methods to follow to improve their system of farming. Very beneficial changes would soon make themselves felt, could we form clubs like that of M. Bourbeau. I have observed among the French-Canadians in the Eastern Townships, in the districts in which M. Bourbeau lives, a great deal of interest taken in agricultural matters. I have also found lately on the part of the farmers a great anxiety to be present at the meetings of the clubs. But in our neighbourhood, there are by far too few farmers at the meetings, where agriculture is the subject of conversation ; people imagine that anyone can conduct a farm ; this is a mistake ; to be a farmer, one has a great deal to study and to learn. I thank you, gentlemen, for having listened to me for so long.

*M. Bourbeau :*—Allow me still one word on the subject of the clubs : get a good secretary, one who will make good reports. If you can find one

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who will do for you what M. Poirier has done for us—he earned us the flattering compliment Mr. Barnard paid us just now—my success will be certain.

*M. l'abbé Montminy.*—Since we are speaking of the clubs, I have a word to say : I approve the idea of syndicates of clubs, because, if we intend to succeed, it is by means of syndicates that our success will come. Syndicates are being organised everywhere ; but in order to have a syndicate, we must first have clubs ; they are the raw materials ; and if it requires a great deal of energy to found a club, it takes, perhaps, still more to keep it going. The first sessions are sure to be numerously attended ; the members are assiduous enough the first year ; but it almost invariably happens, that, lecturers not being easily come-atable, the interest in the club diminishes, and the number of attendants falls off. M. Bourbeau has shown us the advantage of having a centre whence we can derive information. Another advantage of the syndicate is the certainty of finding lecturers there : a club without lecturers, is like a house without furniture. It seems to me that it would be easy, when once the central office is established, to arrange for the visits, at least every two months, of lecturers who would, at the same time, judge of the progress made since the last meeting.

Many a time have I succeeded in starting long discussions by a series of questions addressed for the most part to such of the members as I knew to be the most backward and the least zealous in everything that is connected with improved farming. I would say, for instance, speaking to *Pierre*, whom I knew to be the most negligent of men about taking care of manure : “ Well *Pierre*, my friend, what is the best plan for making the greatest possible quantity of manure ” ?

*Pierre* would rise, rather puzzled : — “ One good plan is to store away several loads of ditch scrapings, in a very dry state, to put under the cattle to absorb the urine, which otherwise would be lost ; or, to make composts with straw, urine and solid dung, ashes,” &c.

—“ Do you follow this out at home, *Pierre* ” ?

—“ No, I do not, it takes too much time.”

After *Pierre*, another took his turn, and it often happened that if, as at first going off, no one would begin, a little later, everybody was talking so much and so well that I, myself, could not get a word in.

Hence, we may rest convinced that lectures and discussions are the soul of a club. Therefore, let us take means to establish a syndicate from which we may be able to obtain lecturers when we require their services by simply asking to have them sent to us.

*M. l'abbé Beaudry.*—The idea of having lecturers, which has just been so earnestly pressed on our attention, is all very well ; but what would be better would be to have one always at hand, always present, in the cupboard : I speak of the *Journal d'Agriculture of the Province of Quebec*, a paper full of interesting facts, and calculated to spread a taste for farm-

ing by means of the varied essays of its distinguished contributors. Other papers there are full of information; there are a crowd of reviews, which all deserve a place in the farmer's home; among the last, I will place at the head the "Cultivator and Country Gentleman," a weekly review, illustrated, with from 25 to 30 pages of reading matter, edited by thoroughly practical farmers. The subscription to this paper is \$2.50 a year. At the request of one interested in it I have undertaken to get up reading-clubs [*book-clubs*], which enables me to send this paper to subscribers for \$1.50. I will place on the table, this evening, specimen-copies of this publication; those who wish to subscribe have only to give me their names: I will manage the correspondence and pay the postage as well. [NOTE.—M. l'abbé Beaudry's address is La Presentation, Quebec.]

*Mr. Barnard.*—Mr. President, if this question is settled, let us pass to another. I was requested by the Hon. Louis Beaubien, the Commissioner of Agriculture, to attend the meetings of the Dairymen's Associations of Bedford and of the State of Vermont. In my journey, I picked up a mass of information, some of which I am about to relate to you.

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DESCRIPTION, BY MR. ED. A. BARNARD, OF WHAT HE SAW  
DURING HIS JOURNEY TO VERMONT AND AT HIS VISIT  
TO THE BUTTER-SCHOOL AT BURLINGTON VT.

I recently visited the greatest creamery in the whole world, the one at St. Albans, Vt. As much as 10,000 lbs of butter has been made there in one day during the first year of its existence, and the factory is so arranged that 20,000 lbs of butter can be turned out easily in a day. It is, so to speak, fed by 50 centrifugal separators, placed at a radius of some leagues from the central factory, and the milk and cream are brought thither either in special vehicles, or by the numerous railroads that meet in St. Albans. This enormous enterprise, managed, practically, by Mr. Palmer, formerly of Danville, Q., and therefore a Canadian, with satisfactory success from its inception, has created so much interest, that the State authorities thought fit to establish, last December, a

SPECIAL BUTTER-SCHOOL

in connection with the University, the farm-school, the experimental station &c., all official organisations of the State, united at Burlington. Having been informed of this by Mr. Palmer himself, at an exhaustive visit paid to his magnificent establishment, I put myself into communication with Prof. Cooke, director of the farm-school. The faculty of agriculture, with a readiness for which we cannot be too grateful, agreed to give, gratuitously, theoretical and practical instruction to seven or eight of our best butter-

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#### WHAT HE SAW AT HIS VISIT GTON VT.

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experimental station urlington. Having khaustive visit paid ommunication with of agriculture, with o give, gratuitously, of our best butter-

makers, during the whole of the course, which lasts four weeks. Eight pupils attended the course which ended November 30th. During my journeys, backwards and forwards, to Brattleboro, I was lucky enough to travel with Prof. Cooke, Director of this school, and Mr. Hills, Professor of applied chemistry. &c. Both these gentlemen, in the name of the professors of the school, praised our pupils most highly, assuring me that the English-speaking ones are now thoroughly capable of conducting any similar school that may in the future be established in this province. These pupils, then, are fitted to deliver useful lectures in all that concerns the making of butter; they can, moreover, show how to detect frauds in the milk delivered at the factories; and, lastly, they can speak with thorough knowledge of the treatment of milch-cows, as they have seen it practised at the extensive cow-sheds attached to the Burlington agricultural school. The members of the Dairymen's Association had lately, at Montmagny, an opportunity of applauding one of these pupils, Mr. Aimé Lord, teacher of butter-making at the l'Assomption school. Mr. Lord showed us, in a striking and intelligent manner, the utility of

#### THE BABCOCK TEST,

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

#### FARM-BUILDINGS.

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

In order to add to the fruitfulness of this investigation, I had made, with the kind permission of M. Joly de Lotbinière, president of the Council of Agriculture, an exact model, scale  $\frac{3}{4}$  inch to the foot, of a building the plans of which I have given in the *Journal* in part, and which was erected a short time ago on the farm of the RR. DD. of the Sacred Heart at Lorette. This model, though, contains an important improvement, which, combined with a considerable saving in the cost of the building,

admits of much greater facility in storing the fodder and of its distribution to the cattle. The principles aimed at, and applied to the best of my knowledge, are the following :

1. Strict economy in the whole and in the details ; 2. The proper conditions to ensure, first, the health of the animals ; ample light ; enough warmth ; complete ventilation, without draughts ; constant cleanliness, night and day ; 3. Facility of preparing the food, so as to render it as digestible as possible, and to feed the cattle with as much profit and as little labour as possible ; 4. Pure water, sufficiently tepid, and always within reach of the cattle.

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

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

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

#### THE DAIRYMEN'S ASSOCIATION OF THE STATE OF VERMONT.

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

In the same apartment, there was a fine exhibition of dairy-products. Every year, the society opens a special competition in connection with the

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annual meeting, and gives numerous prizes, which has the effect of inducing many ladies and others interested to visit the convention. I particularly commend these exhibitions of products and special apparatus, in connection with the annual *Conventions*, to the attention of our dairy-men's associations, both provincial and district. They are calculated to double the number of those interested in our *Conventions*.

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

I was delighted to see the deep interest manifested by the leading papers of the United States in the *conventions* of the dairymen's Association. There, I met the editors of eight or nine of these papers, some from Ohio, some from Wisconsin, as well as others from the New-England States. I need not say that the highest authorities of the States as regards the dairy-industry, such as Ex-Governor Hoard, the Hon. Messrs. Gould, of Ohio, T. D. Curtis, of New-Hampshire, Peters, Black, and Bowker, of Massachusetts, Dustan Smith, of the Department of agriculture, at Washington, were among the most appreciated speakers. I cannot enumerate all the distinguished men of Vermont, the ex-governors, the senators, the presidents of the legislative assembly, &c., &c., who spoke on the dairy-industry. Let it be enough to note the fact that, during three days, we had three sessions a day; that not an instant was lost, and, had it not been for the charming music we were treated to, at regular intervals in the afternoon and evenings, it would have been hard work to devote all the requisite attention to the numerous important subjects that were discussed.

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

#### CONCLUSIONS.

This report is already very long. There still remains, however, much to be said of the so precious instruction to be derived from this my visit. I took such notes as will be sufficient to enable me to treat the most impor

tant subjects in the *Journal of Agriculture*, but permit me, Gentlemen, to say a few words about the impressions made upon me during so fruitful a journey. one that will certainly have the effect of facilitating my arduous task as the director of the *Official Journal of Agriculture*. The following is a résumé of my conclusions.

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

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

#### SYNDICATES

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

For, these syndicated-factories have sold 410,000 lbs. of butter at 20½ cts., and 13,000,000 lbs. of cheese, amounting to \$1,700,000, in the first year of their establishment. The excess obtained by the improvement caused by the syndicates in the manufacture of the products cannot be put, at the lowest, at less than \$50,000 ! Now, we have, in this province, 660 cheeseries and 146 creameries. There are, then, only 1/3 of the cheeseries and 1/9 of the creameries syndicated ; there could be, then, half a million dollars gained annually, from this very year, if all our factories were equally well managed.

But, to enable these syndicates to gain their end, we must ensure a supply of intelligent makers, well taught men, honest, and as competent as possible ; out of which body we may select the most skilful to convert into factory inspectors, and, I hope, into lecturers. These men, both inspectors of factories and inspectors-general, should be kept well abreast of the best practices based on science, in order to diffuse to their best ability the teachings that flow from the two—practice and science—whether in the course of their visits of inspection, or in regularly organised lectures.

We have been greatly occupied this evening in considering how to give a powerful aid to instruction by means of farmers' clubs, agricultural societies, &c., &c. A committee, composed of energetic men, selected exclusively from either the officers of the association or from the officers of the agricultural societies or from other bodies of the same kind, was entrusted with the duty of studying and putting into execution a projected

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## UNION OF FARMERS OF THE PROVINCE,

which would furnish us with a society, identical, in its issue and operations, with the association des Agriculteurs de France, and the numerous local syndicates that derive from it.

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

## FARMERS' INSTITUTES

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

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 FOR THE DAIRYMEN'S ASSOCIATION MEETING AT  
MONTMAGNY; 1892.

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

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

Whoever of you travelled in Switzerland some 40 or 50 years ago

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

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

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

As regards the above statement of the quantity of milk yielded daily by the Norman cow, I think there must be an error of some kind. Two

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pounds of butter from 30 litres of milk, would argue that 35 lbs of milk were required to make a pound of butter ; if such were the case, the milk could hardly be termed rich. (1)

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

And what shall we say of my own country, England ? There, at least no one dreams of rearing cows for the dairy that, after a "copious lactation," are only fit to be thrown into the nearest ditch. Look at the great town dairies of London, Manchester, &c., and what do you see ? Grand, well bred Shorthorns, giving from 26 to 28 quarts of fairly rich milk a day, and, at the end of their term of life, at 7 or 8 years old, turned over to the butcher, long before age has rendered their meat unfit for the table of even the middle classes.

Look, again, at the butter-dairies of the West, in Devonshire. Cornwall South-Wales, and almost the same thing presents itself. The cattle are smaller, it is true, but the North-Devons, the Welsh-runts, are all producers of the finest quality of meat, as well as yielders of lots of good milk. No such thing as a "general purpose cow," is not there ? Why all our English cows, except a few Herefords, are general purpose cows ; and we really do know something about our business.

And our own Gloucestershire dairy-cows, whence proceeds the well known Glo'ster cheese, what are they ? By the bye, their owners are not by any means well inclined towards your noble society, since they attribute, in large measure, the falling off in the call for their commodity to the malevolent efforts of the Dairymen's Association of the province of Quebec. Well, what are our cows ? They are what would be called in this country "grade shorthorns," almost all of them. Here and there, may be found cattle with some of the marks of the old Glo'stershire race—low backed, high rumped, lean in the thighs—but, almost without exception,

(1) The *litre* is wrongly translated a *quart* ; it equals .88 of a quart therefore 25 litres=22 quarts.

they bear the stamp of the pure shorthorn bulls introduced into most of the herds some 80 years ago. Are they profitable? Well, the tenants will not change for any other kind, and they know their business, as they must do, seeing they pay \$11.00 a year rent for every acre of land they farm, the tithes and rates bringing the annual burdens up to \$15.00.

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

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

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

The Guernsey cow is no common looking brute; she weighs from 900 lbs. to 1,100 lbs.; her form is wedgelike, high and broad behind, and narrow in front, but not scanty in the brisket. An unprejudiced person, passing judgment on a Guernsey and a Jersey, would say that the former was the more business-like beast.

And, I think, with such a herd, composed, as I said, of Montreal dairy-men's cows and a Guernsey bull, I should not be far wrong, whether I went in for cheese or for butter, and there would be no necessity for throwing the cows into the nearest ditch when they had finished their "period of lactation," nor of knocking the bull-calves on the head as soon as they were born to save the milk necessary for rearing them.

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

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

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

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

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

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

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

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

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

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

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

Having carried the cows safely and profitably through the summer, the next thing you must see to is that they go into winter quarters in good condition. Now that I presume to say most of you have learned that "Winter-dairying," with a judicious system of feeding, may be made to pay quite as well if not better than summer dairying, I need hardly say that drying off cows as soon as November begins is no longer the practice of the farmers of the province.

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

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

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

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

Still, as few farmers here keep more than from 10 to 15 sheep, a considerable quantity of clover will be left, and a better use for it cannot be made than to cut it up into chaff and give it to our barren cow mixed with meal.

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

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

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

Take then, for one cow that is still yielding a moderate quantity of milk, about a bushel of chaff, half clover half sweet, fresh straw, moisten it with water—hot or cold—and mix well up with it six pounds of the following meals:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Of the ash constituents, 2.3 % are stored up as increase, and 97.7 % are voided in the total excrements.

You see, then, that the liquid excrement contains about  $3\frac{1}{3}$  times as much nitrogen as the solid, and, hence, you will see the absolute necessity of preserving the urine of your cattle by absorbents of some kind ; for I do not think liquid manure-tanks are very likely to exist on many farms in this country. Nitrogen, in its cheapest source, that of nitrate of soda, is, thanks to the abominable row in Chili, whence most of it comes, worth \$10.00 a ton more than it was last year ; that is to say, that whereas nitrogen could be bought in England for 10 cents a pound, it now costs at least 12 cents.

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

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

ARTHUR R. JENNER FUST.

Mr. Barnard informed the meeting that on the next day, at 9.30 P. M., two competent men would explain the utility of and the mode of working a new machine, calculated to create a perfect revolution in all the operations of butter and cheese factories. He trusted that the meeting would be as numerous to-morrow, and congratulated the audience at having attended in such numbers on that day, saying : “ the present is one of the largest meetings the Association has ever held.”

Mr. Barnard spoke of Mr. Aimé Lord, who was announced to lecture. Mr. Lord had just arrived from the School of the State of Vermont, to

which he had been sent by the Council of Agriculture of the Province. Out of six Canadians who had attended the course of instruction there, all but one were French-Canadians.

Mr. Barnard then spoke of the new machine, "The Babcock milk and cream tester," for the prevention of fraud at the factories. He showed the difference that existed between the price paid to a farmer whose milk contained 5% of butter, and to one whose milk only tested 3%; adding, that this machine, which would cause a great improvement in the dairy business, would cause a still greater improvement in the rearing of heifers; for the farmer, who intended to rear none but good milch-cows, could have, by means of this little instrument, the means of distinguishing the best milkers in his herd; saying, in conclusion, that he hoped the two new lecturers would be honoured with the presence of a numerous auditory.

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REPORT OF THE COMMITTEE TO EXAMINE THE SAMPLES OF  
KEEPING BUTTER FROM MANITOBA.

*Mr. President and Gentlemen,*

We have the honour to report that the sample of butter from Mr. de la Borderie's creamery, at St. Malo, Man., packed in hermetically sealed tins, for exportation to the colonies, seems to have suffered from heat [see the explanation given of this by M. l'abbé Beaudry, in the annexed letter]; but in every other respect, the butter is an excellent specimen of manufacture. We beg to congratulate the company, that has placed such butter on the market, on the perfection of the packing, which in every respect seems to fulfil all the special requirements of the export trade.

(Signed)

AIME LORD,  
D. MacPHERSON.  
ALEXIS CHICOINE.

Montmagny, Jan. 27th, 1892.

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To M. J. DE L. TACHÉ.

S. S. I. L.

*Sir,*

I have the honour to forward you, for examination by the experts of the Association, a tin of keeping-butter, from the creamery at St. Malo, under the management of M. de la Borderie. I regret to say that this

butter has been melted, the porter of the pipes and in the mill damaged the grain.

27th Jan, 1892.

A sample of the tins

The Secretary of the meeting by Mr. Aug

Every year, the papers reports of profits the ordinary profits.

The publication among the patrons whether the figures distrust the management taken in as good, mu

For the satisfactory proper yield that good the members present the following question

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2. How much but same months?
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butter has been melted twice since it came into my possession. Unknown to me, the porter of the sleeping-car put my portmanteau close to the heating-pipes and in the morning the butter was quite melted, which may have damaged the grain. I believe this sample was made three months ago.

Truly yours,

G. A. BEAUDRY.

27th Jan, 1892.

A sample of the tins was submitted to the meeting.

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#### MR. DUPUIS' QUESTIONS.

The Secretary then read the numerous questions submitted to the meeting by Mr. Auguste Dupuis, of St. Roch.

Every year, the patrons of creameries and cheeseries see in the newspapers reports of profits, obtained in certain factories, which greatly exceed the ordinary profits.

The publication of these reports causes a good deal of disturbance among the patrons who realise smaller profits: they do not know whether the figures given are real or exaggerated; they sometimes distrust the management of their own factories, fancying that the milk, taken in as good, must be really poor.

For the satisfaction of those who, like me, are ill-informed as to the proper yield that good milk ought to give in butter and cheese, I request the members present to give us information on the subject by replying to the following questions:

1. How much cheese ought 100 lbs. of good milk to yield in the several months from June to November?
2. How much butter ought good milk to yield per 100 lbs. in the same months?
3. What milk can be properly called *good*?
4. Are the makers generally provided with instruments with which to ascertain the richness of the milk with precision.
5. Does not the present system of crediting each patron equally with the milk he brings to the factory, without regard to its richness, hinder a great many farmers from sending their milk to the factories?
6. Are there any factories that follow other systems?
7. Which is the more profitable, the manufacture of butter or cheese separately, or the making of butter and cheese from the same milk and therefore skimming the evening's milk?

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8. Is it to be taken as proved, that the initiative taken by the Ontario makers, of sending an agent with samples of cheese to England for exhibition, has had a favorable result.

9. Is this one of the reasons why Ontario cheese sells for more than Quebec cheese ?

10. Is it Quebec cheese that the Montreal papers quote at an inferior price, under the designation of "*French cheese*?" Is there any reason why cheese from our part of the province should be so designated as inferior? If our cheese is *not* so good as the western cheese, there ought to be some means of remedying the defects.

If our cheese *is* as good as Ontario cheese, this designation of "*French*," applied to ordinary cheese, is an insult against which the Dairymen's Association is requested to protest.

11. What is the usual charge, per lb. for making butter or cheese in the provinces of Quebec and Ontario ?

12. Have the makers any means of agreeing among themselves to sell butter and cheese delivered at the cheesery or creamery, or at the nearest railroad station, for ready money? and that, to avoid losses to the patrons in weight, injury, and other risks ?

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## EXAMINATION AND DISCUSSION OF THE QUESTIONS OF M. DUPUIS.

### FIRST QUESTION.

*The Inspector of weights and measures* declared that, in his visits to verify the scales at the cheeseries and creameries, he met with many faulty scales that caused a loss to the patrons of half a pound to the 50 lbs. of milk. The loss was progressive, according to the increase of weight, some patrons losing 4 lbs. and 5 lbs per 100 lbs. of milk. And more; certain makers refused to allow of the verification of their scales, under the pretext that they did not belong to any association, that they were not dealing in any goods [*keeping a shop*?], and that they did not sell their cheese by the weight these scales indicated. The law not empowering him to compel the makers to allow their scales to be tested, he received instructions "to do nothing in such cases, as he was not sufficiently supported by the law."

The inspector drew the attention of the members of the association to the propriety of getting the law amended. He had been requested by a great many patrons to verify such or such a set of scales, but owing to the objections of certain makers, he could not agree to their request.

The cost of verifying scales is 75 cents for one up to 500 lbs., and \$1.00 for one up to 1,000 lbs.

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*M. Côté* regretted that to be tested.

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*The President* improve at the The milk brought inspection. The of their milk, they would of The intelligent food, and giving rich milk, would laboured to add hand, the latter example in the



*Mr. Barnard.*—I should be glad to hear that the proposal of Dr. Bruneau had been put into execution, and I beg Mr. Chapais to take note of what he has just heard and to use his influence to get the law amended.

*M. Côté* said that he was ready to second the motion, and that he regretted that certain proprietors of factories refused to allow their scales to be tested.

*The President.*—These remarks have been made for some time, and it is known now that the weight of the milk is not honestly recorded. Under the pretext that they are not really defrauding the patrons, certain makers reduce, in this way, the quantity of milk delivered, so as to appear to pay higher for it per 100 lbs. If the patron does not always actually lose by this proceeding, no less is there an attack made by it on the good reputation of the neighbouring maker, who conducts his business honestly. We pointed out this state of things long ago, and we may congratulate ourselves on its being pointed out anew by the inspectors of weights and measures. We shall try to get the law altered, so that the maker may be compelled to allow his scales to be tested.

*M. Alphonse Nicole.*—It sometimes happens that inspectors, too zealous in their work, test, and certify as correct, scales that ought to be cast aside as useless. I paid 75 cents for the testing of a set of scales that I could only use for a week afterwards.

*Mr. Barnard.*—It seems to me that this is a very important matter. The inspector ought to assure himself that the machine is not past service; he ought to ascertain its value before proceeding to test its correctness. By arriving at a practical solution of this question, we shall be doing a very great service to the province.

*M. Bruneau.*—I think that the accusations brought against the inspector's work are not well founded. The presumption is in favour of his doing his duty properly; the rate of charges for tests is imposed in favour of the treasury, and not of the inspector. What interest, then, would the latter have in testing worn-out scales?

*The President.*—With an improved system of inspection we should improve at the same time the position of both the patron and the maker. The milk brought to the factory by the patrons might also be submitted to inspection. The negligent ones, those that do not take proper care of their milk, or skim off some of the cream, would be paid in accordance; they would only receive their due and not rob their neighbour of his rights. The intelligent farmer who, by supplying them with plenty of healthful food, and giving them great attention, succeeds in making his cows yield rich milk, would be righteously repaid for his exertions, instead of having laboured to add to the profits of his more careless neighbour. On the other hand, the latter seeing the profits realised by the former, would follow his example in the path of progress.

There are some reports from factories that return very uncommon yields, causing one to believe in a degree of richness in their milk which it is not easy to account for; especially since another factory, equally well managed, and at work in the same place, finds it cannot succeed in paying the same per centage.

#### THIRD AND FOURTH QUESTIONS.

*M. Taché.*—It would, perhaps, be better to ask M. Côté what is the average yield of 100 lbs. of milk in the different months of the season.

*M. Côté.*—That depends: In the district below Quebec, the yield in June is generally from  $9\frac{1}{2}$  lbs. to  $9\frac{3}{4}$  lbs. of cheese per 100 lbs. of milk; in the Eastern Townships there may be a difference of  $\frac{1}{4}$  lb. less.

*The President.*—Judging from past experience, I should say that, for the month of June, 9 lbs. may be considered as a fair average for below Quebec.

*M. Chapais.*—In comparing this with the townships, a difference of one month must be made.

*M. Pelletier, Cap St. Ignace.*—From notes made at my factory, it took 9 lbs. 7 oz. of milk to make a pound of cheese; yield 11.26 %.

*M. Chapais.*—(In reply to a question). I have not the figures to give the information asked for, as to the yield of cheese from 100 lbs. of milk.

*M. Bourbeau.*—There are so many different methods of making cheese in use, Mr. President, that the makers ought to hand us any notes that they may have made on the quantity of milk required at their respective factories.

*M. Methot, Kingsy Falls.*—With us, the yield in June was 10.58 lbs. in July, 10.33 lbs.; in August, 10.20 lbs., per 100 lbs. of milk.

*A maker.*—From the sales of the four first weeks (of the season?) I find that it took  $10\frac{1}{4}$  lbs. of milk to the lb. of cheese; 2nd sales, 10 lbs.; 3rd  $9\frac{3}{4}$ ; 4th  $9\frac{3}{4}$ ; 5th for August,  $9\frac{1}{8}$ ; last sales, September and October,  $8\frac{3}{8}$  lbs.

*M. Bourbeau.*—The inspector showed me that, in Somerset, a little less cheese was made from the 100 lbs. of milk than at our place while, in the rear of us, still more was made. The better the water springs and the richer the pastures, the better the yield.

M. Dupuis' 3rd, 4th, 5th, 6th and 7th questions having been put, MM. Taché and Barnard suggested that a committee be appointed to examine into them and to report thereon.

The Secretary then submitted some observations concerning a uniform pattern of formulary to be used in the publication of the reports of the operations of the factories. These reports have to be solemnly affirmed to before a magistrate. This formulary is the only one recognised by the Association. Copies of it can be had on application to the Secretary.

*Mr. Barnard.*—to those fantastical general interests. would kindly send Journal d'Agriculture pretty hard on liars

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*Mr. Barnard.*—It would be an important step, were we to put a stop to those fantastical and dishonest reports that cannot but injure the general interests. If those makers who have cause to complain of such would kindly send a copy of the report supposed to be erroneous to the Journal d'Agriculture, I would willingly give my opinion about it. I am pretty hard on liars.

*M. Brodeur* observed that no dependence could be placed on accounts in the papers that such and such a factory had turned out such and such a quantity of goods.

#### TENTH QUESTION.

*The President* called attention to the injustice committed by certain exporters, who marked good cheese as the production of Ontario, and branded as "French" [*Canadian*] the inferior goods of Ontario.

*Mr. Barnard* named certain exhibitions where our cheese had carried off the first prizes, and thereby established the superiority of ours over the Ontario make.

*M. Bourbeau.*—We have formed a syndicate, and engaged an inspector to visit those factories that form part of the syndicate, and to teach the makers the best method to lead them to success. It has been proved that a great change has taken place during the season. The cheese has been noted as being of superior quality, first rate, indeed. It has fetched a higher price than the goods of those factories that are not in the syndicate. A peculiar trade-mark has been adopted by one syndicate; it is stamped on the boxes to distinguish the products of our Association. Dealers have often begged us not to brand our boxes in this fashion.

*M. Taché.*—We have just been talking of syndicates; the chief motive of the forming of these associations is to place the factories belonging to them under the control of an inspector who has received a diploma; this insures the production of superior goods and a more remunerative price to the patrons. As we aim at having the richest quality of milk, so we aim at making the best products out of it.

*Mr. Barnard.*—I hope to see the time when the best cheese on the English market will be "French" cheese.

*M. Chapais.*—Although we have been making good cheese in the past, our trade-mark not being recognised, our goods were sold as from Ontario, while the inferior cheese of that province was called *French cheese*.

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27th January, 1892; 8.15 P. M.

## OFFICIAL OPENING OF THE CONVENTION.

ADDRESS OF THE PRESIDENT.

*M. Naz. Bernatchez,**Ladies and Gentlemen,*

I have the honour to open the tenth annual convention of the Dairymen's Association of the Province of Quebec.

It gives me great pleasure to observe such a numerous assembly present this evening.

Allow me, Ladies and Gentlemen, to bid you welcome, and thank you for having flocked hither in such numbers to attend the deliberations of our Dairymen's Association. It creates a sensation, does our association, it creates a sensation in the province; but with reason, and in the general interest of the public. Ten years ago, at its foundation, the dairy-industry, in the Province of Quebec, was, so to speak, a thing of no consequence. You know in what a condition our dairy-goods were; you observed how, at first, a few cheese-factories were established, here and there, and not without great difficulty. Criticism, as is always the case in new enterprises, had its fling at us; but, our association held on its way. In the end, by dint of striving and of displaying, at each meeting of the association, the good to be derived from the dairy-business, it took an upward flight that, to-day, enables it to figure with advantage by the side of the associations of the province of Ontario.

From a few scattered cheese-factories at that epoch, we have gradually raised the figures until we have attained to the number—important enough for the Province of Quebec—of 700 creameries and cheese-factories.

People used to say, when factories began to increase in number :

If every body is going to set about making cheese, there will be no profit in it. About butter, the same was said : if we all make butter, the price will fall down to nothing.

Well, gentlemen, are these goods sold now cheaper than they used to be ? the price of them, like the price of all other things in the market, varies ; but the price of cheese is almost as good as it was ten years ago, and as for butter, the price is much better than it was then.

Thus, gentlemen, it was a mistake to trouble ourselves about this, and why ? Because there is an immense market for the efflux of these goods. Make butter, make cheese, and you will always find outlets for their exportation.

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The dairy-business in the province of Quebe, is assuredly the most profitable of all farm-work, especially in the district of Quebec, on account of the climate, and on account of our so short summer. If you grow grain-crops, you will often met with disasters; grow fodder-crops and you will always succeed. With fodder-crops you will feed your cows well; with well-fed cows you will have good milk; with good milk you will make good butter and cheese; and good butter and cheese will always bring in money.

On looking back to what has happened during these last few years, we see that harvests have failed several times. Were it not for our creameries and cheeseries in the district of Quebec, we should be in a "parlous" state. It is this industry that has supported our farmers; it has kept the population of this district on its legs.

This year, we are fortunate enough to have had good crops, and our goods have sold well; so we see once more ease and plenty abroad over our country, and every face smiling with contentment.

I do not intend to make you a long speech; we have lost our morning, and we are rather behind hand in our work; so I will be short.

Allow me to say one word to you, about a new industry of which people are talking a good deal at present, and which, I hope, is going to establish itself in the province of Quebec: I mean the business of making condensed milk and *lactated food*.

I was glad, this afternoon, to hear the report of Mr. Aug. Dupuis, who, as you know, was our representative, last winter, at the Jamaica exhibition, where he showed samples of our dairy products. He sent us a favourable report of our exhibits. It is with pleasure, gentlemen, that I learned, from the letter M. Taché read to us this afternoon, that the condensed milk from the Truro factory, Nova Scotia, met with genuine success on the Jamaica market, and was not found inferior to the Swiss condensed milk: which is not saying a little.

I was fortunate enough to visit, when in Switzerland, a condensed milk factory; one of the largest in Europe. The milk is condensed by the evaporation of a certain proportion of the water contained in milk in its natural state. *Lactated food* is made by adding a certain quantity of maize-flour, powdered bread crusts, and a little phosphate of lime to the condensed milk. It is a much simpler manufacture than that of condensed milk; the manufacture of lactated food requires a good capital to work it; the condensed milk manufacture can be carried on with a smaller capital, still, even that requires some means.

In the factory I visited, 240,000 lbs. of milk are worked up, daily, into condensed milk and lactated food: 240,000 lbs. a day. The whole of this is exported; some comes even as far as Canada. The proprietor told me he was in the habit of sending his milk to our market, to Montreal, Quebec, &c.

If such be the case, gentlemen, can we not manage to found such a trade in our country, where the milk is quite as rich as it is in Switzerland, where the raw material is still cheaper? Look at Nova-Scotia; the condensed milk prepared there is as good as that of the Swiss make. Well, cannot we, in the province of Quebec, manage to do as well in this trade as they do in Nova-Scotia?

Now, gentlemen, I am well aware that for this manufacture a certain capital will be needed; but that will easily be found, when people are convinced there is money to be made out of the business. Again, there is no danger of not finding a market for the goods; for if the Swiss do now export great quantities of condensed milk, the consumption of it increases from day to day. The hot countries that produce no milk, use immense quantities of it, and year after year, the demand for it will increase considerably in proportion to the improvement that takes place in the means of communication.

On the English market, you have an enormous outlet. Mr. Nestle, the proprietor of the Swiss factory, told us his best markets were Liverpool and New York.

We are much nearer New York than the Swiss are; freight would be much less costly to us; again, the raw material is cheaper here, so we should have very great advantage in the sale of this novel product. When we shall have the knowledge necessary to bring this branch of the dairy-industry to perfection, we shall be in a position to cope with the great foreign manufacturers.

Gentlemen, I have great confidence in the future of the province of Quebec. It will not lag behind in what concerns the dairy-industry. When we contemplate, as I said this afternoon, the crowd of devoted men, who are consecrating their lives to the promotion of the business in this province; when we see such numerous attendants on our meetings as are present this evening, and as have always been present at our previous meetings; we may hope for success, nay, we may feel secure of its attainment. Our people are looking towards the acquirement of new knowledge; they are striving to make the manufacture of dairy-goods perfect; and they are heartily disposed to devote themselves zealously to the progress of this trade.

I will not detain you any longer, gentlemen; Mr. Chapais is about to read you a lecture, and he will be more interesting to you than I. I will not take up your time, for it is limited. I shall have to address you on other subjects. I would only bid you welcome this evening, and tell you how proud we are to see you here in such great numbers. I welcome all the strangers, all those persons of distinction who honour us with their presence, and I welcome the ladies who, this evening add to the brilliant effect of our meeting (Applause).

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Accept, Ladies

ON THE REFORMS

*Mr. President,*

*Ladies*

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In the name of the Association, Ladies and Gentlemen, once more I say : Be Welcome, and I trust that you will not regret the trouble you have taken in coming to this convention, where lectures, discussions, and conversations will occupy the greater part of our sessions. I hope the attendance to-morrow will be still more numerous than it is this evening. I know of people from a distance who have not yet got here ; so, I am confident that to-morrow, throughout the day, we shall have very numerous attendants, who will do honour to the association and to all those who devote themselves to the interests of the dairy-industry of the province of Quebec.

Accept, Ladies and Gentlemen my thanks for your kind attention.

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### LECTURE BY M. J. C. CHAPAIS.

ON THE REFORMS TO BE MADE AND THE PROGRESS TO BE ACCOMPLISHED  
IN THE DAIRY-INDUSTRY.

*Mr. President,*

*Ladies and Gentlemen,*

In my position as assistant commissioner of the Dairy-industry of the Dominion, I am called upon to keep travelling about, almost constantly, in the different parts of the country, to give different kinds of instruction on that subject. Last year, I was requested to pass almost the whole summer in travelling through our lovely province of Quebec, and these journeys have put me into a position not only to relate to you the progress made here in the dairy-business, but also to lay my finger on the faults and errors we have unfortunately to deplore in the conduct of that industry.

“ Every medal has its reverse,” is an old and true saying ; It has always one side handsome and the other plain. I am supposed to be the man who shows the plain side of the medal at our conventions. In spite of the fact of its not being one that is in general favourably viewed by the world, I think that it is a very necessary part. It is all very well to display the improvements we are making and to take account of the advance we have made along the road of progress, but it is also wise to consider the digressions we may have unintentionally made, digressions not on that account less injurious to our interests.

During the last year I made 54 visits in the Province of Quebec, in 48 places, and in 34 distinct counties : in other words. I went through by far the greater part of the province.

Such visits as I am called upon to make, are made with three different objects : in some, I am called upon to give lectures on agriculture in its intimate relation with dairying. In former conventions, I have taken occasion to relate in detail the gist of these addresses, on agriculture as connected with dairying ; therefore this evening, I shall only point out concisely the scope of these lectures, and thus enable you to judge, generally, how all farmers who intend to devote themselves to dairying should carry on their business.

This may be condensed into two principal points :

The Dairyman must aim at producing the greatest quantity possible of milk at the lowest possible cost. There are three ways of arriving at this result :

First, a judicious selection of milch-cows ; secondly, the proper way of feeding these cows ; thirdly, taking the best care of them by good quarters, good water, good ventilation, and good pasturage in summer.

The dairy-man's second aim, after having made plenty of milk at little cost, should be to make as much out of this milk as possible. There are three ways of doing this : first, he must keep his milk sound, it must be good milk. By *sound* milk, I mean milk that is given by cows in good health, milk properly strained, well cooled and aerated, and taken to the factory in perfect purity, neither lowered by water nor deprived of part of its cream.

Secondly, after having produced milk of this quality, he ought to incite the factory, whither he takes his milk, to do the best possible with it. to make the best cheese and the best butter, in order to obtain the highest price.

To arrive at this, he ought to do every thing in his power to forward the formation of syndicates, on which subject I have already addressed you, and shall address you at greater length further on.

In the third place, those farmers of the province of Quebec, who aim at getting the greatest possible profit out of their cows, must try to bring about a change, that I shall call a radical change, in the way in which this milk is produced. Instead of being satisfied with milking their cows from May to November or December, and often not beginning till June, they ought to try to produce milk, and plenty of it, in winter, to make butter fit for exportation during that season ; for it is a fact that our summer butter is hardly fit for exportation, though our winter butter is perfectly adapted to that purpose. Experiments have been made by the department which I have the honour to represent. Our aim in making them was to show that it is to our greater interest to make cheese in summer and butter in winter, in one and the same factory. I would draw your attention, briefly, this evening to this point, which has already been discussed at length, and shortly will be discussed again.

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The second point of view, with which I made the visits of which I have spoken, was that I thought it well to go to all the different factories in the province of Quebec, in company with an inspector, a man skilled in butter and cheese making, and acquainted with all the machines used for testing milk, there to give the makers all the instruction they might want.

It is on the subject of these visits I intend to speak to you at greater length this evening. To these visits I owe it, that I found out certain defects on which I am about to enlarge a little.

Our system of dairying, compared with what it was ten years ago, has made immense progress. It would make still more, if we did not often find so many makers and patrons of factories who do not yet understand their duty, or, if they do understand it, neglect to do it.

And first, in too many places, in spite of people being better taught, thanks to the full instructions they have received at different times, makers are too often found working in badly constructed buildings. We see cheese-factories put up frequently in buildings that can have been nothing but old barns repaired a little, just to receive the work-people; it is true, the too easy entrance of rain has been prevented, but what has unfortunately not been attended to is the hindering of the entrance of the sun's rays at the hottest time of the day. We begin, then, with a very defective building, in which the very best maker cannot possibly get his cheese to keep, however well it may have been made. I have seen makers, at several places, working away under disadvantages such as these. They have told me: our milk is as good as at other factories; we are sure of making the best of cheese; but we cannot in any way pretend to keep good cheese in such buildings as these.

This leads me to speak about another defect in these buildings: the curing-rooms. Too frequently, during my visits this year, I met with most defective curing-rooms, even in factories otherwise well arranged. Those who put them up, however inclined to do their best, neglected the principles that should guide the builder in arranging such rooms.

The first principle that should be studied in making rooms for curing cheese, is to insure a perfect control of temperature. The maker must be able to maintain in the drying-room a constant temperature of, say 70° F. But, what did I see in my visits? When the outside air was at 86° to 88° I found the curing-room temperature to be 84°! It even often happened that these rooms had a southern exposure, and we found that, towards 11 A.M., their interior temperature was higher than the exterior at the north side of the building. Under such conditions, no maker can turn out cheese fit for market. This fault exists in certain factories that are supposed to be well arranged, and, as they cost a good deal to build, people seem to think that this fault cannot really exist, and the person who takes upon himself to criticise the arrangement of the curing room, is looked upon as a surly fellow, one difficult to please. Well, it is better to take too many

precautions then too few. When a disinterested man visits a factory, and points out a defect, the best plan is to try and convince yourself that, having no interest in deceiving you, he is working for your good, and that you had better accept his suggestions.

Another great defect, one that unfortunately exists in a greater number of factories than would be supposed, is want of attention to cleanliness. Foulness may proceed in factories from two different sources: from the patrons, or from the makers. And, first, of the patrons: there are many of them who, in spite of oft repeated instruction, persist in not straining their milk before sending it to the factory. One factory I met with, where only two out of thirty-two patrons strained their milk! So, when the milk arrived at the factory, the strainers quickly got choked up, and would no longer let the milk through.

When a patron's milk is not strained, the milk-cans he sends it out in are generally very foul. In every case they are very untidy; for the patron who does not strain his milk, shows by that neglect the greatest signs of untidy habits: he is, probably, slovenly in the treatment of his vessels; slovenly in his milking—milks without washing his filthy hands and never cleans the cows' udders—, and slovenly about the whole treatment of his milk. I do not say that this is universal, but, sad to say, it is of too frequent occurrence. Against this state of things the maker ought to set his face firmly.

There are factories where, although their makers are very skilful, it is really very difficult for them to make cheese that may be classed as *pretty* good, owing to the little care they take of things. The implements, used about the milk, are allowed to get dirty very easily, and the result of that is that they very soon acquire a bad taste. We find curd-knives and curd-mills, in some factories, disgustingly filthy. Be assured that this always causes the production of inferior goods, for it introduces into the butter and cheese germs of corruption, which tend to decompose them, and deteriorate the quality of the product, even when the factory in which it is made is of the first class.

This brings me to the question of bad milk, of which, apropos of straining, I have already said a few words

What is meant by bad milk? It is always good to give a definition of this, since in certain factories I visited this year, when I told the patrons they were in the habit of bringing milk that was not fit to be manufactured, the reply always was: but milk is not sour.

Many of the patrons only know of two kinds of milk; sweet and sour. According to them, when milk is sweet, it is good, when sour, it is bad.

Well, I can tell you, and it will, doubtless, surprise some of you, that sour milk is preferable to sweet milk, if the latter has a bad smell, has not been aerated, and is in bad condition.

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With sour milk, the maker perceives the defect at once, and, if he has the necessary knowledge, he speedily administers a remedy. With milk that has some other defect, it is often difficult enough to find it out, unless great care is taken in the receiving of the milk; and a great risk is run of making a bad article with it, since there is less chance of correcting the defect.

This bad milk, unfortunately, is often met with. I have seen makers who were in the habit of receiving bad milk because, as they said, they could not tell by the smell, whether it was good or bad.

Not to be affected by bad smells, is a quality that may be convenient under certain circumstances, but in a butter or cheese maker, it is a great fault; and I would advise those in whom this sense is defective to smell at salts (*ammonia*), or (a more vulgar remedy) to take snuff to clear their olfactories. (Laughter.)

The question of bad milk is more important than people think, for, in using it, a risk is run of losing a whole vat of cheese; and not only that, but bad milk always gives a bad yield. Milk that has not been well aerated, that has not been promptly cooled, will never yield as much as milk that has been properly treated. It is a fact that has been proved by the practice of the best makers in the Dominion, among others by Mr. MacPherson, whom we have with us this evening, and who has made experiments on the subject. Besides, it is a settled business. The patron who sends bad milk to the factory, runs the risk of causing a bad vat of cheese to be made: he lowers the yield, and, in these two ways, he makes himself culpable both as regards the maker and the other patrons.

To get rid of bad milk, science has come to our aid. For our protection against the dishonesty and the carelessness of the patrons, it has supplied us with instruments, more or less complicated, by means of which it is in our power, with a good deal of trouble and with a certain amount of acquaintance with the laws of chemistry, to succeed in discovering the defects that may exist in milk. But these methods, till within the last few years, were too complicated, and beyond the reach of the majority of the public.

Now, however, science has made an immense stride in bringing to our aid, last year, an apparatus which seems to combine in itself all the qualities necessary for the detection of the faults of milk. This apparatus is called the "Babcock Tester."

Many of the makers who hear me, know it well; for we took upon ourselves, this year, to carry with us one of these instruments into all the factories we visited, and to make experiments with it.

The apparatus was thought by every one to be so simple, so useful, and so discriminating, that many makers, as well as many inspectors of syndicates, bought one. I congratulate those gentlemen who had enough enterprise to induce them to employ this instrument, as soon as it was made known to them, in having thus made the industry with which they are concerned take an important onward step in the path of progress.

The Babcock tester, by means of a small dose of sulphuric acid, and certain very easy manipulations, enables us to discover the defects in any sample of milk, and to prevent frauds. With it, the milk of 30 cows can be tested at once; and when the milk is once in the vials and the acid added, it only takes a few minutes to determine the value of the milk under analysis.

The utility of this apparatus in creameries is direct, as it indicates at once the value of the milk, and shows the maker with the greatest ease whether it has been fraudulently dealt with or not.

We had just arrived at a creamery, which belongs to one of the most intelligent of makers; the model creamery, I may say, of the province (I do not say this to pay an out of the way compliment, but because I like to render justice where it is due); I mean the creamery of M. Préfontaine, at Isle Verte.

When we arrived there, we set about making tests with the Babcock. We took three samples of milk, and we showed: that, in one some cream had been skimmed—about 30%; to another, water had been added; and that, to the other, the owner, still more craftily, had added skin-milk.

When we had made our report, the maker said to us; We are perfectly satisfied with your instrument, for we had set a snare for you; we had previously adulterated these milk samples, in a known proportion, to see if you would detect it, and you have brought the facts out correctly. So we are convinced of the great accuracy of the apparatus.

Besides, this apparatus, which is an American invention, has been employed for two years in the States; for one year in this province; and it is already well known, and is become widely popular, in the old countries. Everywhere, it is agreed that it is destined to cause, in our business, that great revolution, which we have been in search of for many a long day, and which it was a difficult task to bring about before the invention of this instrument; I mean the payment of each patron for his milk according to its real value. In the province of Quebec, we know of herds which, towards the end of the summer, gave milk capable of yielding  $4\frac{1}{2}$  lbs of butter to the 100 lbs; other herds only gave three pounds; but we found some, that although they were in normal condition, yielded only 2 lbs,  $2\frac{1}{5}$  lbs of butter to the 100 lbs of milk. Still, the patron that supplied the milk containing  $4\frac{1}{2}$  lbs, he who had 3 lbs, and he who had only  $2\frac{4}{5}$  lbs of butter in 100 lbs of milk, all received the same rate of payment: you see the injustice of this.

With this apparatus, we could have settled the affair at once; and the maker with whom we were, said that he was very sure that, when the patrons saw the difference, the owner of the richest milk would set about getting milk paid for in accordance with its true value.

And this is what we must come to in our province; milk must be paid for in accordance with its contents in butter-fats; and this, I say, will

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be an immense step in advance, when we shall have secured it. We are on the eve of getting it done; it has already begun to work, and with this instrument, progress will be rapid.

Another great fault that I observed in my visits is carelessness in the work of the factories; by which I mean:

In many factories, during our visits, we used to chat in the course of the day with the makers, so as to get at their views on the methods of manufacture. We met with some men of intelligence, who perfectly understood their duties, who knew the necessary degree of acidity, of heat, &c.; they seemed, indeed, to thoroughly understand their trade; but strangely enough on watching them at work, we saw that they neglected to make use of a great part of the principles with which they were so well acquainted. I perceived that the reason of this was that they wanted to get over their work, so as to have the sooner to leave in the evening.

In many factories, it is understood that the cheese should be finished at a certain hour. Whether it had been cold at night, whether there had been a thunder-storm, whether the rennet had been added early or late, makes no odds to the maker. He hastens the method of working, and thus it comes about that he gets: one day, soft cheese; the next day, hard cheese; another day, cheese that becomes liquid. A maker that behaves in this way is not honest; and more, he is not doing himself justice, he is causing his master to lose money, and his conscience has to bear the burden of it.

Another thing, that I have met with among makers, is what I will call *intuitive knowledge* (*science infuse.*).

Some makers, who have not been very long at work, seem to know everything without having learnt it. When we arrive at their factories, these good people receive us with bare civility, they do not care for our visit. If they allow us to cast an eye over the factory, which, to their idea, is kept in the most perfect manner, we are not to make any observations upon it, and they give us to understand that they know their trade, and that they do not require any advice from us. Happy people! For, gentlemen, we all, you as well as I, except a very few of us, are in need of advice.

Such people, who hold their heads so loftily, and who seem to think they possess intuitive knowledge, make us think of those ears of grain which, at harvest, seem to dominate a whole field of wheat. You know that when the wheat is ripe, the ear becomes heavy, and bends over. But there are fine large ears, very long, that carry their heads pretty high over the rest. A man who is not a farmer, as he passes alongside of the field, on seeing these fine ears would think that they must be by far the best, because they stand higher than the rest; but those who understand wheat, know well that these heads hold no grain, and that this is the reason why they carry themselves so proudly. (Applause.)

Those makers, who seem so vain of their knowledge, are the most ignorant of those whom I have seen. Their heads are empty, and that is why they carry them so high.

Some visits I made, last year, were for the purpose of establishing syndicates. As a director of the association, I had good reason to promote the institution of these bodies, because all my colleagues in the direction have, for many years, attached great importance to this step.

The object of these syndicates is to bring about a uniformity in the manufacture of cheese, suiting it to the English market. This market is very hard to please. Not satisfied with having one good cheese in a lot, it demands that all the cheese be good and good looking; that its appearance be as good as its quality. To attain to this we must search after divers kinds of uniformity; uniformity in the texture of the cheese; in its colour; in the height and size of the cheeses; and uniformity in the mode of packing. So much uniformity is not easy to secure. It is a matter of making in 25, 50, 100 factories, on different plans, lots of cheese which shall present to the eye of the wholesale merchant the uniformity so much sought after on the English market. This, truly, seems a hard task. We must ensure that each maker, making nothing but good cheese, as a matter of course, shall so make his cheeses that they not only shall be good, but that they shall be exactly like the cheeses turned out in the neighbouring districts. This is very difficult; for any maker may be deceived in the colour of his cheese; he may make it of a higher colour than his neighbour's; he may use boxes of inferior quality; and, lastly, without evil intention, without want of knowledge being attributed to the makers, it is certain that cheeses made in different factories do not generally resemble one another. To attain to this resemblance, we are trying to establish a system that seems likely to secure our object: it is this: we hope to ensure to all the makers, by means of the visits and instruction of specialist inspectors, a uniform method of manufacture. The inspectors will themselves receive their instructions from an inspector-general, who will, himself, derive knowledge from the best sources; as, for instance, from our department of the Dairy-Industry, at Ottawa, where there is a model creamery and a model cheese-factory; or in the great schools in the United States, where young men are enabled to study, and, in time, are fitted to become inspectors. A man who has acquired his knowledge from a special source and who transmits this knowledge to inspectors, who, in their turn hand it on to the makers: this represents to us the ideal of a system, that will enable us to obtain uniformity in the manufacture of cheese of the highest class.

This is just what has led us to push the work of the syndicates, which is, to-day, getting on well in this province. Syndicates have been established: many have been started this year; last year there were two; the result was highly satisfactory, so we have had no trouble in forming eight more this year. In every case, they have answered well. For instance:

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Within the bounds of one of these syndicates, certain factories, not under a syndicate, had lost last year \$1,200 through badly conducted manufacture, they having turned out only second-rate instead of first-rate cheese. This year, the loss was reduced to \$200, instead of, as formerly, \$1,200. There has been, then, an improvement of five-sixths in the results of the season's make. This is an immense step made, if we consider how little time it took to accomplish it.

Within the limits of another syndicate, where, last year, there had been a pretty heavy loss at one factory, there has not been in all the factories, this year, as much loss as there was last year in one. This will show you, at once, that the result has been excellent, and so the people are well pleased. The syndicated factories, too, sell their goods much more easily than they used to do. Buyers, whom I met in my travels, told me that, in certain places where once they had to inspect the cheese, they could now buy by telegram, since they were convinced, by the report of the inspectors of syndicates, that the cheese was of first-rate quality.

You see what great progress has been made. In factories, where it used to be difficult to sell cheese even after inspection, sales are made, on the report of the inspectors, by telegram. This ought to make us proud, and encourage us to march forward, and endeavour to make of the Province of Quebec one large syndicate, whence the cheese sent shall be always uniform in quality, and competent to sustain an arduous contest successfully against Ontario cheese in the English market.

You ought to be encouraged by what I have just said to promote with all your power this so important work, and to occupy yourself in establishing, this year, syndicates where there are none.

For our part, we undertake to furnish inspectors in sufficient numbers. The examination to which the association subjects the men who offer themselves for certificates of inspectorship, guarantees that they shall be perfectly qualified for the position they are to occupy. You may feel secure that, in the regions where there are no syndicates, when such are established, the same results will follow that have been obtained in those regions where they have already been at work.

Allow me, in conclusion, to make some suggestions tending to the general prosperity of our association.

Every year we hold our general convention. Once in the year, we call together all the notables of the dairy-trade, not only of the province of Quebec, but also of the other provinces adjoining, and we try to get at the views of experts on the different modes of making butter and cheese. We do our best to vary the programme of our meetings, to make them pleasant as well as useful to our visitors: good results indisputably flow from these conventions.

Three years ago we visited the little town of l'Assomption. In that district, there were then no factories at work. Now, our visitors from

l'Assomption tell us what a rapid development of factories they have witnessed in that county. There is a great number of factories established there to-day, and this is indubitably due to the visit, though only a very short visit, of our association.

This proves that these yearly conventions have always been followed by good results. Still, these meetings, only occurring once a year, in towns invariably distant from other towns, for we cannot be everywhere at once, do not admit of every one being benefited by them. Then, by visiting different places every year, we change the audience at our conventions, and it ensues that there is always a number of people who have not been able to be present at our sessions and who, in consequence, find themselves deprived of the benefit of our discussions, because we do not return to that place till after the expiration of some years.

There is a way to avoid this : let us do what has been done by our English friends in the Eastern-Townships, by, among others, Mr. Foster and Mr. Fisher ; they hold local conventions, small meetings of the dairy-men of each district. A small committee is formed, where they discuss the great principles that have been laid down and accepted by the large conventions. These meetings have produced remarkable results wherever they have been established.

In my opinion, the directors of our association, who are chosen from the most experienced men in the different districts of our province, should make a point of favoring with all their energies these local meetings, held once or twice a year ; so that the dairy-men may come together there and talk over the needs of their business, and the best means of making its progress more rapid.

This idea was suggested to me several times by those who are the most inclined to assist the progress of our industry, but who have not an opportunity of often attending our annual conventions ; and I trust that in setting this idea before you, I am discharging the devoirs of an efficient director, hoping that each of the directors now in office, or those who are to replace them, will seriously endeavour to encourage these smaller conventions.

To show you with how much care, with how little trouble, good meetings can be got together, I will bring forward two instances which took me quite by surprise :

One day, I had given notice of a visit I was to pay to St. Hermas, in the county of Deux-Montagnes, and I reached that place, in the afternoon, ready to give a lecture. The people asked me to wait till the evening ; I consented, and, when the time came, I was astonished to find myself in presence of an audience of at least 500 persons, come from all parts of the county of Deux Montagnes to listen to my address. It only needed, to arrive at such a gratifying result, one single man whose heart was devoted to the success of the dairy-industry. He had taken the trouble to notify

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his friends in all the surrounding parishes that a meeting was to be held. There was only one lecture and only one subject to be treated, but this got together nearly 500 persons, from every corner of the county, to listen to one lecture on one subject. At St. Tite, the same thing happened; the curé notified 400 or 500 persons, and they came to hear a lecture, of about two hours in duration, on one solitary subject. This proves that there is no difficulty in getting together a numerous audience of farmers, if there is a little trouble taken. They are always ready enough to go to a lecture when they feel sure that their interests will be discussed there.

I should like to say a word on another subject. It is this:

You know that the Federal Government has created a special bureau for the Dairy-industry, in compliance with the wishes of a large number of members of all sorts of political views, and that, a few years ago, ministers, in an interview we had with them, declared that the dairy-industry was the industry best suited to promote the progress of agriculture in the Dominion. Since that time, the Minister of Agriculture has endeavoured to greatly develop this industry; a special department of dairy-industry has been formed to promote the interests of that business in all parts of the Dominion, and we have inspectors appointed to travel through all the provinces.

The Government intends to improve this system still more, by establishing, in every province, experiment-stations, where lessons in the manufacture of Canadian cheese, and of foreign cheese, too, will be given. Our association ought to profit as much as possible by the advantages offered by the Federal Government.

If the Federal Government means to establish one or more experiment-stations, it is clear that young men, belonging to the Dairymen's Association, will have every inducement to follow the work of these stations, and that our association is also interested in enjoying a certain degree of control, not over the stations themselves, but over the instructions given therein, by sending inspectors to visit them, to observe what is done there, and to give practical lessons to the young men, who will derive immense benefit from them, without it costing them a half-penny.

You know that if an association does not do all it seeks to accomplish, it is often because it is short of funds to put all the good ideas into practice. Well, we must be grateful for small mercies [*prendre son bien ou on le trouve*], and profit by the help afforded by another governmental body, which also intends to give a shove to the wheel of the car we are trying to push forward on the road of progress.

One thing we must not forget; it is all right to display the progress we are making, but we must not grow conceited about it. It is certain that, if a time shall arrive when we, like the men whom I was talking to you about just now, begin to fancy we are possessed of "intuitive knowledge," that we have arrived at perfection; it is certain, I say, that then

we shall infallibly begin to retrograde. Humanity is so made, that, if we fail to keep on advancing, we fall into the rear. Man always seeks to advance himself. Look at the operative who has learnt his trade perfectly; the more work he has, the more he tries to get, that he may enrich himself, and provide for his family. The farmer, for his part, in his fields, strives to improve his farming. In the dairy-industry, our makers strive to arrive at perfection in their manufacture, in order to obtain the reputation of turning out the best goods.

It is, then, clear that, if we come to a stand-still, we shall fall back, because those who are around us, keeping on at their work, will advance, and we shall find ourselves behind-hand.

We are a little in the position of a child in a swing; he puts himself strenuously into motion, to get higher and higher; the greater exertions he makes in the movements proper to this exercise, the higher he goes; but if he leave off his efforts, he ceases to rise, and falls gradually lower and lower, till, at last, he returns to the point whence he started.

Such is our position, we must keep on, striving to rise, under the penalty of stopping, tending towards the ground, and, finally, falling back to the rear.

Well, gentlemen, let us always strive to get on; let us make our swing carry us as high as possible, and take good care not to fall out of it, for nothing is so dangerous as a fall. When an effort has once failed, it is very difficult to renew the attempt.

In certain parishes, where people tried to go too fast, several factories were started, each receiving a trifling quantity of milk, where one good factory could have done all the business properly. Well, to get along too fast, they started two or three; they failed, and, in the end, everything was ruined. And since then, if we go into those districts to set things going again, we are met with opposition on account of the previous failure. They tell us: "We have tried it and failed; we are not ready to be taken in again." It is much more difficult to re-establish a thing than to start it afresh in a place where it is a novelty.

I hope you will reflect on the rather disagreeable things I have been saying, but I am convinced that no one to whom I am speaking deserves those unhandsome compliments. Generally speaking, the inferior makers are so inferior that they do not even attend our conventions. Those who are incorrigible, if they do attend, do so rather to pass vicious criticisms on what they hear, and to prevent those who are improving in their trade from getting on, by suggesting prejudices, which deprive them of all idea of taking in good part the counsels that are given them.

We are all sinners in this world, more or less; but when we have something to reproach ourselves with, our good pastors are ready to say to us: "there is a pardon for every sin"; or, again: "there is more joy in heaven over one sinner that repenteth, than over ninety and nine just men who need no repentance."

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And, so, if we have not done all that we ought to have done, let us strive to do better, saying always to ourselves, as a reminder, that if we come to a stand-still in the path of progress, we shall infallibly find ourselves retrograding. [Repeated applause.]

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DISCUSSION ON THE CONFERENCE OF M. J. C. CHAPAIS.

*The Revd. M. Montminy.*—M. MacCarthy promised us a lecture : I should like to hear, from M. Chapais, if he knows anything about M. MacCarthy's work. It seems to me that M. MacCarthy was to have treated the question of the aeration of milk, and I should like to hear if.....

*M. Taché.*—There was an article published in the Journal d'Agriculture about it. I have seen nothing else on the subject.

*M. Montminy.*—What opinion did he give ?

*M. Taché.*—He rather advised the aeration of milk. He combated the notion that it is absolutely necessary to cool milk, in the present condition of our manufacture. He did not assert that the principle of cooling milk, immediately after it left the cow, was erroneous ; he only said that, in the present state of things, he would recommend aeration in preference to cooling.

*M. Chapais.*—As to the question of aerating milk, I know not if there are any great men of science here ; but, at any rate, I will submit the following question to the meeting : Supposing you are dealing with bad-smelling milk,—unfortunately, there is plenty of it in the province of Quebec,—what is the best means of disinfecting it, so that the bad smell may not be transmitted to the butter and cheese made from such milk ?

*M. Taché.*—Monsieur Chicoine has brought, from St. Marc de Verchères, a specimen of an instrument, employed in his creamery, for cooling milk. It is a very cheap instrument, not unlike one that has been already exhibited at previous meetings. It is well known to-day at St. Marc that the patrons have saved, in the season, many times the cost of the instruments they have employed. Mr Chicoine is satisfied that he has been repaid at least five times for his outlay.

*M. Bernatchez.*—I visited the county of Verchères once, and there I met a large farmer who kept a great herd of cows. He uses this instrument for cooling milk, and he told me that, even in very hot weather, he had never, thanks to this instrument, taken any bad milk to the factory. As fast as the milk is drawn, it is put into this tin-pail, pierced with holes in the bottom, under which is another full of cold water which rests on the can ; the milk flows along the pail filled with cold water and falls

into the can, completely cooled and aerated. He said he never had bad milk throughout the summer. It would be an excellent thing, and of great benefit to all farmers, if they made use of this instrument.

The apparatus was then shown to the audience.

*M. Bernatchez.*—In your lecture, M. Chapais, I observe that you said that if milk were sour, any one who really understood his business could always cure the defect. Do you mean by that, that if the remedy be applied properly to this fault, it is possible to get as good a yield from sour milk, and cheese of as good quality, as from perfectly sound milk?

*M. Chapais.*—My idea was this. It is easier for a maker to turn out good cheese from *sour* milk than from *bad* milk. I did not mean to say that it was easy to make good cheese from sour milk, but only that it is easier to deal with a sample of milk, which from the very beginning we know is sour, than with another sample whose bad qualities have escaped the observation of the maker, and for this reason; because, if the defect is discovered at once, there are rules by acting upon which the defect may be obviated.

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LECTURE BY MR. MACFARLANE.

(*This lecture was read by M. J. de L. Taché.*)

THE BEST WAY TO MAKE CHEESE.

*Mr. President and Gentlemen,*

It is not without some embarrassment that I address you on the best method to be followed in making cheese. Still, as I have passed nineteen consecutive years in this business, more, it is true, as a student than as a master, I flatter myself you will pardon me if I try to throw a little light on the subject.

*The first advice* to give to the makers is that they should inspect the milk with the greatest possible care as they are receiving it at the factory. If it is ever so little sour, or if it has any bad smell, it must be positively refused. From time to time, it would be well to remind the patrons of the care they ought to take of their milk, and if any is brought to the factory that has a bad smell, the cause should be sought for, and the remedy applied.

Sometimes dead carcasses, or cesspools, or stagnant ponds, are met with in the neighbourhood of the spot where the milk is aerated, and these are always sources of injury to the milk.

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If there is a conveniency for doing so, the milk may be warmed as it comes in ; and when it has come to the proper heat 86° F. 88° F., take 8 oz. of it, and a teaspoonful of rennet of good quality—rennet is good when 3 or 4 oz are enough to coagulate 1,000 lbs. of milk ; the teaspoonful of rennet is to be stirred up in the 8 oz. of milk ; if coagulation takes place in 15 to 18 seconds, the bulk of the milk is ready for the rennet, but if coagulation does not take place in 18 seconds, the milk is to be allowed to mature in the vat. When it has come to the point, that is, when it coagulates in 15 to 20 seconds in the test-cup, the rennet is to be added. Care must be taken to give rennet enough to cause coagulation to ensue in, say, for May, 20 minutes.

When the coagulation is perfect, that is, when the curd *breaks clean before the finger*, it is to be cut with the horizontal knife, lengthwise of the vat ; then, after allowing the whey to rise a little for 6 or 8 minutes, cut with the vertical knife, first across, and then lengthwise. These three cuttings, when the milk is of good quality are usually enough ; but should the milk be sour, and working fast, cut it a fourth time, so as to have a firm curd.

The cutting finished, *stir* gently for about 5 minutes, and clear away the curd that adheres to the sides and bottom of the vat.

After stirring, warm up gently at first and then faster, to 98° to 100°

From this time, until the acid begins to develop, stir without ceasing, for it is the most propitious time to secure for your cheese a good body.

When the acid begins to develop, the whey is to be drawn off until the curd shows itself, so that, when there shall be enough acidity generated, the rest of the whey can be promptly drawn off. As to the degree of acidity required,  $\frac{1}{8}$  of an inch by the hot iron test is enough in some places ; in others,  $\frac{1}{4}$  inch is required. So that a general rule, good here, will not prove correct in another place ; but every maker will soon learn how to determine the proper degree of acidity in his factory.

As soon as the whey is out of the vat, stir again to get rid of any whey that may still remain in the curd. If the curd is soft, *stir until dry* and firm. Then, pile the curd on the two sides the vat to let the whey escape.

All this time, the curd should be kept up in temperature as much as possible, not being allowed to fall below 94°. When the curd has taken, cut it into blocks, and turn every half hour. Pile it, increasing the height of the layers every turn, until it is 4 layers high. Keep on at this until the curd is fit to grind, which it usually will be in 3 to 3½ hours. The curd is fit to grind when it has a rich, glossy appearance, and when, on drawing it out, it shows its fibrous condition, and tears like india-rubber.

Another test that the curd is fit to grind : note the time elapsed from the setting of the rennet to the complete draining off of the whey from the curd ; then, allow about the same time to elapse between the beginning to pile and the grinding, taking care to keep the curd always warm, and to turn every half hour.

After grinding, spread the curd over the vat or in the sink, and stir every 8 or 10 minutes. If it is not porous (*full of small holes*), salt as soon as the particles of the curd are cicatrised. If it be porous, keep on stirring, and do not salt until the gas has all escaped and the holes are closed.

The dose of salt to be used is : May,  $1\frac{1}{2}$  to 2 lbs. ; June, 2 to  $2\frac{1}{2}$  lbs. ; July and August,  $2\frac{1}{2}$  lbs. ; Sept.,  $2\frac{3}{4}$  lbs. ; Oct. and Nov., 3 lbs. The dose of salt should be increased in proportion to the diminution of the dose of rennet. To mix the salt thoroughly, the curd should be well stirred, and as soon as the salt is dissolved, or incorporated, which will take place in 15 to 20 minutes, it may be put into the hoops (*go to press*) at about 80° or 85°. Make good sized cheeses, 70 to 75 lbs. each, and not too large in diameter. Press carefully, equally and gradually, at least during the first hour. After the first 30 or 40 minutes, the cheeses are taken out of the press, that the cotton bandages on the sides may be stretched, so that there be no folds. The cheeses are then returned to press, taking care that the pressure be evenly distributed. Next morning, examine the cheeses and turn them, if possible, to get rid of any edges which may have got stuck up round the followers (*disques*). The cheeses should be kept in the hoops as long as possible, at least 20 hours, and look in the morning to see that the pressure be constant and continuous.

When taken out of press, the cheese is placed on the shelves in the ripening chamber. If the tops and bottoms (*les bouts*) of the cheese are not covered with bandages, the open parts must be smeared at once with whey-butter, to prevent them from splitting.

The cheeses must be turned and rubbed every day. The temperature of the ripening room must be kept at 70°, and, in summer as cool as possible. Before delivery, cheese must be allowed to ripen for at least ten days, in May, and during the subsequent months, for at least 15 days, but it should not be kept more than a month. The best plan is to sell it neither too soon nor too late, but just when it is in its best condition.

The boxes in which it is packed are to be exactly proportioned to the size of the cheese. When it is to be sold green, in weighing give *full* weight. If the box is not full, the sides must be cut down to the level of the cheese ; but it is far better to make the cheese large enough to do away with the necessity of losing time in cutting down the boxes.

Take care that the calico bandages be not too long ; an inch or an inch and a half of overlap at each end is enough.

The weight and trade-mark must be legibly branded on the boxes. A stencil-plate with a series of figures, is the best thing with which to mark the weight of the cheese. Its employment will get rid of many a difficulty between buyers and sellers.

Should it happen that a maker one day turns out an inferior lot of cheese, he ought not to offer it as first quality. He may succeed once or twice, but he must not forget that it will make him an object of suspicion

to the buyers. If once established, other makers who

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*M. Taché.*—It is ready to reply. perfect satisfaction

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to the buyers. His reputation is a matter of importance, and when that is once established, it must be guarded jealously; for there are everywhere other makers who are earnest competitors in the trade.

The system of inspection introduced by this association into the province, has tended to raise the reputation of our cheese, and I do not hesitate to say that the results of inspection during the year 1891 have been to enrich our farmers by at least \$250,000 of extra price gained by the sale of cheese. Let us hope that, in 1892 the additional profit will be half a million. The cheese of the fair province of Quebec has gained a name, let us keep it in the front rank, and travel onwards in the path of progress until at last we stand at the head of the market.

*M. Taché.*—If any maker has now questions to ask Mr. MacFarlane, he is ready to reply. He is a man of vast experience, and has always given perfect satisfaction to the syndicates that have employed him.

*A Delegate.*—What difference of treatment do you make between a curd that remains in the whey two or three hours and a curd that remains in it three or four hours?

*Mr. MacFarlane.*—With a curd that only remains thirty minutes in the whey you can make very good cheese, if you harden the curd by constant stirring. Curd works quicker in the whey than when dry, and runs less risk of cooling too much; but care must be taken not to postpone the running-off of the whey too long, especially if the milk was a little forward [sour].

*M. Bernatchez.*—To what do you attribute porosity in cheese: its having lots of little eyes in it?

*Mr. MacFarlane.*—To the milk having been bad. It is invariably the fault of the milk, if cheese has these defects.

*M. Bernatchez.*—If a vat of milk works quickly, so that, after half an hour's heating, it indicates the drawing off of the whey, how would you treat that curd? How long would it be before you ground it? How would you deal with a curd which shows acidity half an hour after drawing off the whey?

*M. Taché.*—Mr. MacFarlane lays stress on the need of the maker's testing the quality and condition of the milk by means of the ordinary methods. If coagulation takes place in 18 seconds, that milk will behave properly during the process of making. If the curd shows signs of working too fast, all the operations must be hastened; the whey drawn off as soon as possible; and the working that the curd should have undergone, by its own action, in the whey, must be replaced by prolonged stirring.

*M. Bernatchez.*—How long do you leave a curd that has worked quickly in the vat, after the whey has been drawn-off?

*M. Tache.*—We can judge of this in the same way as I described just now. If an hour has elapsed, from the setting to the drawing-off of the whole whey, an hour in the vat will do for the cheese. By the former part of the operation, we can judge how the cheese will behave in the second part.

*A Delegate.*—Is it better that the whey take 3 hours or 1 hour to flow off?

*M. Tache.*—Mr. MacFarlane says that when it takes only 1 hour, the yield will be diminished, because the milk will have been working too fast. As to 3 hours, that is nearly the outside limit, generally speaking.

*A Delegate.*—Do you not think that, by leaving the curd 3 hours in the whey, the cheese might acquire a bad flavour, and by leaving it only one hour and cutting it down at the end of two hours, it would have more body?

*M. Taché.*—Mr. MacFarlane does not mean to say that three hours are to elapse between the moment that the curd is cut down and the moment when the whey is drawn-off, but he speaks of three hours that elapse between setting the milk, and the drawing off of the whey. He speaks of these three hours as the regular duration of the operations to be gone through, from the *setting* to the running-off of the whey.

*A Delegate.*—Do you think that the lapse of four or five hours would have any bad effect?

*M. Taché.*—The important point is to judge of the state of the milk by the test of the rennet in the cup of milk and not to put the rennet into the vat, until you are sure that the milk will behave in the normal way. If the milk is too fresh, you must wait before *setting*. Mr. MacFarlane thinks it would be unsafe to leave the curd for three hours in the whey after the warming-up. It would be very dangerous.

*M. Allard.*—Is the rule given us—to put 1 drachm of rennet to 8 oz. of milk—good for all seasons?

*M. Taché.*—For all seasons.

*M. Allard.*—Equally for all kinds of temperature; summer and winter?

*M. Taché.*—Yes.

*M. Allard.*—Is the number of seconds of waiting time the same for all seasons?

*M. Taché.*—Yes: the important thing is to have the milk at the same point in all seasons.

*M. Chapais.*—At certain seasons, we must wait for 2 hours before *setting*; at others, only 20 minutes. The only difference is the question of time necessary to wait before setting.

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*M. Veilleux.*—What would Mr. MacFarlane do if the curd, after having been  $2\frac{1}{2}$  hours in the whey, were to mount to the surface ; were to rise entirely, or almost entirely, on to the top of the whey ?

*M. Taché.*—Mr. MacFarlane says that it is clear that, in such a case, the maker must have made some mistake, and that this must be remedied in the best possible way. He himself never saw curd rise in this manner.

*M. Veilleux.*—But if it should happen, what must be done ?

*M. Taché.*—There is nothing to be done.

*Mr. Mac Donald.*—This has happened to me several times already.

*M. Taché.*—The mistake committed in the manufacture may be remedied by man's labour ; that is, as Mr. Macdonald teaches, after allowing the acidity to develop, stir rapidly and continuously to get rid of porosity.

*M. Veilleux.*—I hold that the curd should be left longer in the vat after the whey has been drawn off.

*M. Taché.*—Mr. MacFarlane says that he would allow the acidity to develop before he draw off the whey. It would develop quicker in the whey than dry in the vat. Both these authorities agree that, generally, there is no danger, and that it is better to allow the acidity to develop in the whey. Cases may happen, however, when this operation would take too long ; then, it would be better to run off the whey.

*A Maker.*—I always thought that if milk was not warm enough, if an insufficient quantity of rennet had been used, and, in consequence, the coagulation had taken too long, that this might cause "floating curd." This has happened to me sometimes, when the coagulation took 40 or 45 minutes. The milk was too fresh, and I had not used rennet enough to cause coagulation in 25 or 30 minutes : this it was that caused the curd to swim.

*M. Chapais.*—In such a case, is the weight yielded less ?

*A Maker.*—By heating more or less ; I always, in such cases, warmed up more ; I let it go ahead (*filer*) ; there is no danger.

*M. Chapais.*—And you lost none ?

*A Maker.*—Not a bit.

*M. Chapais.*—Mr. MacPherson is here, and I should like to hear his opinion on this point.

*M. Taché.*—Mr. MacPherson, will you kindly explain to us the cause of floating curd ?

*Mr. Mac Pherson.*—There are several : milk with a bad smell, or in a state of decomposition, foul vessels, defect of aeration, and any filth in the

milk, or the fall of any rotten body in it. If a cow be chased by dogs and heated, a feverish state in the animal ensues; its milk will be damaged, and this defect, of *floating curd*, will be the upshot.

The two chief causes are: want of cleanliness in the cans and the neglect of aeration. In most cases, aeration is especially requisite.

The remedy is to cut the curd rather coarser than usual, not to warm up so high (perhaps one degree less, say from 97° to 98°), and to postpone running off the whey a little longer.

One characteristic, which will announce the probable development of this defect, is that the curd will seem to harden more than usual.

When the curd is porous, this accident springs from the same cause, but this takes place later. *Floating curd* comes from the same cause, but takes place earlier in the process.

If the maker is afraid of this defect occurring, let him cut the curd more coarsely, and allow a greater development of acidity than usual. If the curd be thus cut, it will retain more whey, and this overplus of whey will give it a tendency to acetify more promptly. But it must be thoroughly understood that curd in this condition is to be kept at as high a temperature as other kinds, and it must be stirred till the porosity disappears. The chief thing is to keep the temperature very high.

*A Maker.*—How can the workman prevent this mishap?

*M. Taché.*—Mr. MacFarlane says that, in this case, the curd has a tendency to harden more than usual; the whey separates from it more quickly.

*M. Bouchard.*—When the cheese is made and dried, there is sometimes a tendency in it to crack at the top or bottom: how can this be prevented?

*Mr. MacFarlane.*—When cracks appear at the side of the cheese, it is usually due to the cheese not having undergone enough pressure: when at the top or bottom, the cheese is sour or souring, or the bandage or something connected with the press is sour. Sourness in any part of this apparatus will always cause the top and bottom of the cheese to crack. It depends on acidity, either in the cheese, or in something that is in contact with it.

*A Maker.*—At our factory, we receive three or four milkings at once; I should like to know if there is much difference in the reception of three or four milkings at once, and only one or two?

*Mr. MacFarlane.*—If the milk has been perfectly well kept, it will behave as well. There is no loss, if the milk be in good condition.

*A Maker.*—If milk has been put into well cleaned vessels, and the cream has risen to the surface and got dry, do you think this cream will not be injurious to the whey?

*Mr. MacFarlane.*—I have had some difficulty in getting the cream to rise, but it has dried on to the surface of the vat, and the clot of cream [morice]

*Mr. MacDonal.*—I have had some grains on the milk

*Mr. MacFarlane.*—It is the duty of the maker to make

*A Maker.*—I should like to see the vat as full-milk

*M. Taché.*—Mr.

*M. Taché.*—Mr. Barnard has been relating to certain matters at making his farm to the meeting.

*Mr. Barnard.*—I should be glad of a few minutes, and I should be glad to see you in a satisfactory manner.

You will allow me to say that the Association is not present to-day, but by some most important matters that he would certainly be glad to see you at the Association. I have had the pleasure of meeting him, he always meets me, and I hope we shall devote some time to the culture, and especially to the culture of the cheese. Every time I saw him, I was certain he would be all, doubtless, are accessible to get him to la with the advancement of the cheese, which nothing but the culture of the cheese or something else—I hope we are expecti

*Mr. MacFarlane.*—If the milk is perfectly well stirred, there is no difficulty in getting cream in this state to combine with it. If the cream has dried on to the tops of the cans, and become so firm that it forms a clot of cream [*morceau de crème*], that is another question altogether.

*Mr. MacDonald.*—Do you think that cream that has formed in little grains on the milk can be compelled to combine with the cheese?

*Mr. MacFarlane.*—No; but this, it is evident, springs from carelessness. It is the duty of the patron to see to this, rather than the duty of the maker to make this cream combine with his cheese.

*A Maker.*—I should like to know if skim-cheese can remain as long in the vat as full-milk cheese and be as good.

*M. Taché.*—Mr. MacFarlane says he has never made any skim-cheese.

*M. Taché.*—Mr. MacPherson had prepared an essay for this meeting, relating to certain enquiries as to the mode in which a farmer, who aims at making his farm pay, should conduct his business. As it is in English, Mr. Barnard has translated it, and the translation will accordingly be read to the meeting.

*Mr. Barnard.*—I propose, Mr. President, to postpone the reading of this lecture till to-morrow, as the attendance will then probably be greater. I should be glad of this postponement, because I made the translation in a few minutes, and I should be very sorry not to be able to read it in a satisfactory manner.

You will allow me, gentlemen, to tell you that if the Hon. Louis Beaubien is not present this evening, it is because he must have been detained by some most important occurrence. He telegraphed to me on Sunday that he would certainly come. I know how deeply he is interested in this association. I have frequently met him since he has been at Quebec, and each time that he came to the Department, each time I had the honour of meeting him, he always said the same thing: "If, Mr. Barnard, I return here, I hope we shall devote ourselves as much as possible to the cause of agriculture, and especially to the Dairy-industry." He repeated this phrase every time I saw him. So often did he repeat it, that, every time I met him, I was certain beforehand I should hear the same set of words. You all, doubtless, are acquainted with M. Beaubien; no more energetic man breathes on earth, when he takes an idea into his head, it is almost impossible to get him to lay it aside. If M. Beaubien is to have anything to do with the advancement of agriculture, you may be sure he will begin by pushing forward the dairy-industry. I thought it my duty—in his absence which nothing but important reasons can explain; illness in his family, or something else—I thought it, I say, my duty to make these observations while we are expecting his arrival.

*M. Taché.*—To have done with the subject of cheese, I will read you this translation of a few notes prepared by Mr. McDonald, who was for two years at the school-factory of the association, at St. Hyacinthe, and who has been inspector of the association for two years. Since he left us, he has been acting as buyer for two large firms at Montreal. He has travelled over most parts of the provinces of Quebec and Ontario. These notes of his are of great importance, for he is a man of extensive experience both as cheese maker and buyer.

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NOTES BY MR. J. A. McDONALD.

(Read by M. J. de L. Taché.)

REMARKS OF A BUYER.

*Mr. President and Gentlemen,*

In venturing to submit a few remarks to this convention, I have to bring to your notice certain facts relating to some flaws at present existing in the dairy-industry of this province; flaws which can easily be amended; and to show you, moreover, certain improvements that can be applied to the said industry without difficulty. The advancement of this industry depends upon the attention that shall be paid to both these points.

Having, during the past season, visited cheese-factories in the district of Ingersoll, in the West of Ontario, and some in Northern New-York; and having made a number of trips through the province of Quebec, I had many opportunities of comparing Western dairying with that of our province; and, I must confess that we might borrow a great number of improvements from our rivals in the West.

At the beginning of last season, I had the pleasure of visiting 6 or 7 factories near Ingersoll, and of making cheese there, in a factory belonging to Mr. Sweet.

To begin with, I must tell you that the buildings at these factories are very superior to those in our province; most of them being remarkable for the substantial style of the erections, and for the clapboarded, painted exterior.

*The Making-room* I found large and, from being well lined, perfectly warm and comfortable. The equipments of every kind were of the best, and kept perfectly clean and in good order. Nothing was wanting for the manufacture of first-class cheese.

*The Curing-room* is entirely separate from the making-room, being about ten feet away from it. From the making-room, the cheese is carried to the *curing-room*, where the temperature can be kept between 70° and 75°, in the very hottest, as well as in ordinary weather. In

this way, the cheese room and the heat in this province, by ing it of its flavour v curing-rooms are do them lath-and-plaster dwelling-houses, wh throughout the year attention.

The milk is weighed any milk that he this and sent home. This factory, but he will find cheesemen of those patron, no other makers patrons take great care their very best to set factory.

I was present at Ingersoll, one morning sent to grass. I carefed of 7,000 lbs. I did not

The Maker visited twice; and, should I his cans (by keeping they may get tainted likely to injure the milk take better care, his perfect condition.

*In Northern New Ontario*; still, I found in our province; so I your models, and not beating them; and that I have pointed out to

After having visited their cheese is much better. You, now, know the fitting remedy. Past is a little of that care their milk and its maker then bring your dairy

It is truly dishonourable to the province for cheese and buyers are often blamed

this way, the cheese escapes entirely both the steam of the working-room and the heat of the boiler, which frequently injure the cheese in this province, by over-heating it before it is cured, and by depriving it of its flavour while on the shelves before being sent to market. The curing-rooms are double-boarded, papered, and clapboarded, and, most of them lath-and-plastered on the inside ; indeed, they are as comfortable as dwelling-houses, which enables the maker to regulate the temperature throughout the year : a detail of great importance and one worthy of your attention.

The milk is weighed and inspected by the maker as it arrives, and any milk that he thinks unfit to make first class cheese is at once rejected and sent home. This the patron is, of course, at liberty to take to another factory, but he will find it rejected there too ; for there is a rule among the cheesemen of those parts that, when a maker has refused the milk of a patron, no other maker will accept it ; and the effect of this is that the patrons take great care of their milk, employ aerators, and in general do their very best to send nothing but the very highest quality of milk to the factory.

I was present at the reception of the milk at Mr. Sweet's factory, at Ingersoll, one morning in the last week of April, before the cows had been sent to grass. I carefully examined every can of milk as it arrived, and out of 7,000 lbs. I did not find one tainted sample.

The Maker visits each of the patrons at least once a week ; sometimes twice ; and, should he find any of them careless about the cleanliness of his cans (by keeping them near the whey-tank, or in some place where they may get tainted by the smell of the farm-yard, or by any other thing likely to injure the milk), he will at once warn the sinner that, if he do not take better care, his milk will be rejected. Thus, he ensures milk in perfect condition.

*In Northern New-York*, I was not so greatly pleased as in Western Ontario ; still, I found their factories better kept than some of the factories in our province ; so I would advise you to take our Western competitors as your models, and not to be content with only equalling them, but to aim at beating them ; and this you can only do by strict attention to the matters I have pointed out to you.

After having visited Ingersoll, I am not at all surprised to find that their cheese is much more sought after, and obtains better prices than ours. You, now, know the reason of this, and it is your business to apply the fitting remedy. Pastures and cows you have, already ; all that is needed is a little of that care and attention which the Western people bestow on their milk and its manufacture, and I see no reason why you should not then bring your dairy products to an equality with theirs.

It is truly disheartening to cheese-buyers to have to hunt over this province for cheese able to stand a comparison with Ontario cheese. The buyers are often blamed, when, in reality, the maker is the sinner.

So much for the improvements to be made: now, let us speak of the inspectors and their work in this province.

During the past season, I bought cheese in all parts of this province, and visited every district where there was an inspector, except Chicoutimi. In the Eastern Townships, I found a great improvement. The patrons were doing their best to take care of their milk, and the result was easily seen, as at the Sherbrooke Exhibition, they carried off the first prizes which were open to the whole Dominion. This was by no means the case in the Townships two years ago; then, their cheese had a very bad flavor, which seemed difficult to cure. I believe that the greatest improvement made in the province is to be found in the Townships, and I attribute it, in a great measure, to the work of the inspectors. This will appear still more prominently when we compare the Townships' cheese with that from Rimouski, &c., where there are no inspectors: the cheese from these places is very poor. Some cheeseries turn out good cheese to-day and bad cheese to-morrow; on the whole, the make is very unequal, which shows that instruction is needed. On the North-shore, below Montreal, and all along the North-shore line of rail between Montreal and Quebec, the same needs are seriously present. The marked improvements in the districts where the inspectors have been at work, are a sufficient proof that their exertions have not been without reward; and those districts that have no inspectors, are so behind-hand, that they really ought to secure the services of one at once.

I have said so much in favor of the inspectors, that I may now be permitted to find fault with them as to one or two points.

In some cases, it seems to me that the inspectors have over-stepped their duty by placing themselves between the buyer and the seller. Thus, on one occasion, I lost five or six hundred cheeses through the season. It happened thus: an inspector had an interest in three factories, whose cheese I had bought in the beginning of the season. Returning thither later to buy the cheese of the three factories, I found it was no longer of the best quality, and I told the president of the factory so; but the inspector had decided that the cheese was first class, they "took no stock" in my opinion, and refused to sell me the cheese, thinking, of course, that I was depreciating it with a view to getting it cheaper; so I lost the cheese of these factories for the rest of the season. And yet, my judgment was perfectly correct, and the inspector was as decidedly wrong, and this evil arose from the inspector having erroneously classified the cheese, declaring it to be of the first-class, when he knew perfectly well that it was not. Should such a case occur again, I shall certainly complain of the inspector so offending; for nothing but evil can flow from such a mode of acting. Our inspectors are not paid to hide the faults of the manufacture; on the contrary, they are supposed to find them out, and, when they meet with any, to make them known to all persons interested; and not only that, but they should take off their coats and go to work to remedy the mistakes, by teaching the makers how to obviate them for the future.

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Some inspectors like to play the gentleman; they arrive at a factory in their carriage, inspect the cheese carelessly, mark it "first-class," and jump into their carriage again; neglecting, very often, the faults in the manufacture, over which they ought to pause, and to which they ought to seek to apply a remedy.

I have observed, that whenever an inspector took off his coat and set to work, the results were very much better than in those factories visited by inspectors who played "the great man."

I trust my remarks will be received in the same spirit in which they are made, that is, that of pushing the interests of the dairy-industry of the Province of Quebec, and I shall be happy, should they bear good fruit among the patrons, the makers, and the inspectors.

With my best wishes for the success of the dairy-industry of this province, so well represented here, I am, Gentlemen,

Your very obedient servant,

(signed)

JOHN A. McDONALD.

At 10.40 P.M. the convention adjourned till the next day, at 9.30 A.M.

Session of 28<sup>th</sup> January, 1892.

LECTURE BY M. H. NAGANT.

PRACTICAL TEST OF MILK BY THE BABCOCK METHOD.

DESCRIPTION AND MANIPULATION.

*A lecture given at the Montmagny Meeting of the Dairymen's Association ;  
By M. H. Nagant.*

Last year, we had the satisfaction of announcing to our readers (see the April No. of the *Journal of Agriculture* for 1891, p. 59) that at last a practical method had been discovered of making an exact and speedy test of milk. Up to that time, we had hardly any other alternative, to gain a true idea of the value of a sample of milk, than either to get an analysis of it made by a chemist working in his laboratory, a long and costly proceeding, or to make use of methods simple enough, but, generally speaking, very inexact.

But, you will say, how about the *lactometer*, what use do you make of that? Are not its indications recognised as satisfactory when it is used

successively on full milk first, and then on the same milk skimmed? Let us answer at once, for the good reputation of the lactometer, that it is a good and trustworthy instrument, a happy invention, and one that very nearly answers the expectations its inventor formed of it; that is to say that with a *good* lactometer it is easy to discover if the milk tested is pure or adulterated, an important result as regards the detection of fraud. On this account, this instrument will always enjoy a share of the public favour. But, are we always to rest satisfied with knowing if milk is pure or not? Would it not be as well for us to enquire if it is not time for the maker of butter or cheese, who wishes to conduct his business in a sensible manner, to examine carefully the composition of the raw material (the milk) which he is about to go to work upon for the purpose of extracting from it butter or cheese? In all other industries, the workman knows perfectly well how far he can depend upon the different materials he receives, before he pays for them, works them up, and sends their products to market. It is in a great measure on this knowledge that he bases his manufacture and his calculations to impress a certain, fixed direction to the conduct of his affairs. Why, up to the present time, has the maker of butter and cheese been an exception to this general rule? Because there had not yet been invented an easy and thoroughly practical method of analysing milk, more especially as concerned the fatty matters it contained. Now, the new Babcock method enables us to fill up this void, and it is unnecessary to expatiate at length on its advantages and good qualities, seeing that it is regularly employed in almost all the large dairies in the Northern States, and the chemists, who have submitted it to comparative tests with the most rigorous scientific methods, admit that it possesses such a degree of exactitude as renders it absolutely sufficient for practical use.

Before describing this new method, let us in a few words recall to our memories the composition of milk:

In the first place, here is a definition of it given by professor Babcock, in which I shall presume to make a slight modification:

Milk is an *emulsion* (1) of fatty matter [butter] in a watery solution, more or less complete, of albuminoid matters [casein or cheesy matter and albumen], of sugar of milk, and of mineral salts.

Average composition of milk:

100 lbs of milk contain, on an average, 87½ lbs of water and 12½ lbs of solid matters, as exhibited below:

(1) An emulsion is a liquid holding in suspension an insoluble fatty matter which is in the state of very tiny globules, which impart to the liquid an appearance of cloudiness more or less translucent and opalescent. Any one can make an emulsion by vigorously shaking a flask containing some water to which is added a little linseed oil.

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Water.....	87½ lbs.
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Casein (cheesy matter).....	3½ “
Albumen.....	0½ “
Sugar of milk and mineral salts.....	5 “
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	100 lbs.

While the percentage of butter may vary in different qualities of milk from 2½ lbs. to 7 lbs., the casein and all the other solid matters only vary from 8½ lbs. to 10 lbs.

Of all the elements of milk, butter is the most valuable: in fact, it is this element that gives its value to the milk and which, therefore, ought to be the basis of every valuation of milk. Besides, every one knows that skim-milk has only a very slight relative value, although it is worth a good deal more than many farmers think.

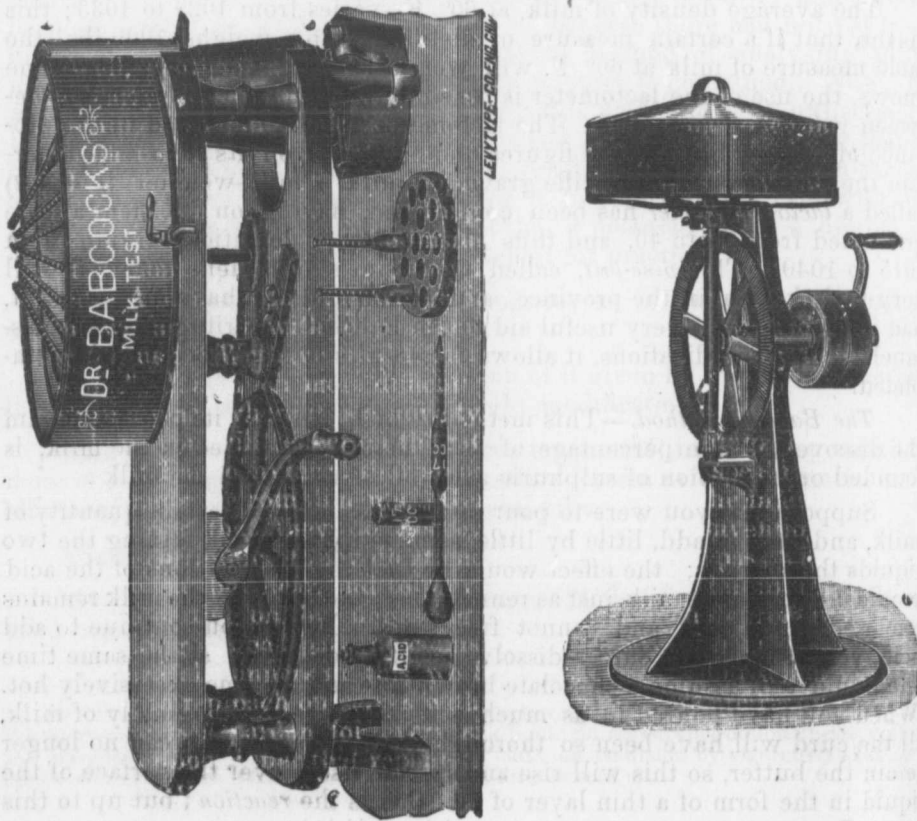
The average density of milk, at 60° F., varies from 1029 to 1033; this means, that if a certain measure of distilled water weighs 1000 lbs., the same measure of milk at 60° F. will weigh 1029 to 1033. As every one knows, the use of the lactometer is based on the difference of density between water and pure milk. The lactometer usually employed in the province of Quebec has not the figures quoted above on its stem. To ascertain the true density or specific gravity of milk, a milk-weigher (*pèse lait*) called a *lacto-densimeter* has been constructed, having on its stem a scale graduated from 15 to 40, and thus able to show densities varying from 1015 to 1040. This *pèse-lait*, called Quèvenne's lacto-densimeter, is still very little known in the province, and we should not have mentioned it, had it not become a very useful aid to the Babcock centrifugal tester, inasmuch as, by its indications, it allows the results of the Babcock to be completed.

*The Babcock method.*—This method, which has for its proximate aim the discovery of the percentage of fatty matter contained in the milk, is founded on the action of sulphuric acid (oil of vitriol) on the milk:

Suppose that you were to pour into a glass bottle a certain quantity of milk, and then to add, little by little, some sulphuric acid, mixing the two liquids thoroughly; the effect would be that the first portions of the acid would coagulate the milk, just as rennet does; the butter of the milk remains enclosed in the curd and cannot free itself. But, if you continue to add acid, you will see the curd redissolve itself by degrees; at the same time the liquid will assume a chocolate brown hue and become excessively hot. When you have poured in as much acid as there was originally of milk, all the curd will have been so thoroughly dissolved that it can no longer retain the butter, so this will rise and spread itself over the surface of the liquid in the form of a thin layer of oil: this is the *reaction*; but up to this

time the separation of the butter is not complete, for there still remains some of it throughout the depth of the liquid. In order to compel the whole of the butter to rise to the surface, all we have to do is to fix the bottle containing the milk and acid in a turbine, or centrifugal machine, taking care to lean the neck of the bottle toward the centre of rotation, and to make the turbine revolve at the rate of 700 revolutions a minute; the centrifugal force will then act as in the centrifugal separator; it will compel the butter, which is the lightest, to betake itself wholly to the point nearest to the axis of rotation, and the separation of the butter from the rest of the liquid will be complete: such is the Babcock machine.

Of this machine there are several types, contrived by the different makers, but they all work on the same principle: a wheel capable of making 700 to 800 revolutions a minute (see engraving p. 98) carries on its periphery a certain number of cylindrical pouches slightly inclined and leaning in the direction of the spokes. These pouches, varying in number from 4 to 60, according to the size of the machine, are intended to receive the *graduated bottles* (fig. 1).



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The glass bottles (fig. 1) have long necks, bearing a scale graduated from 0, 1, 2, &c., up to 8, 9, or 10; the figures 1, 2, 3, &c., signifying 1, 2, 3, % and the intermediate divisions representing the 0.20 %.

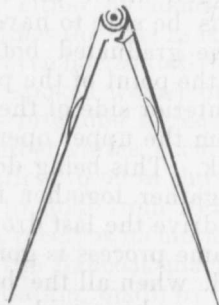


Fig. 4.

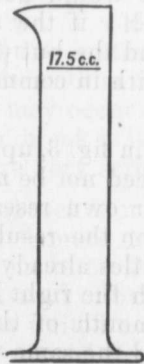


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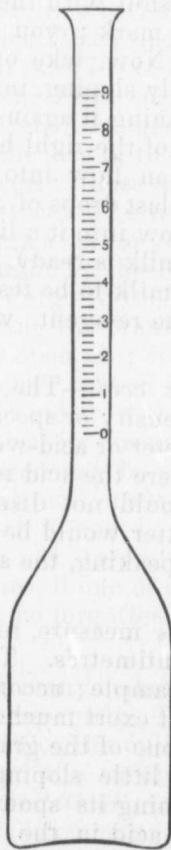


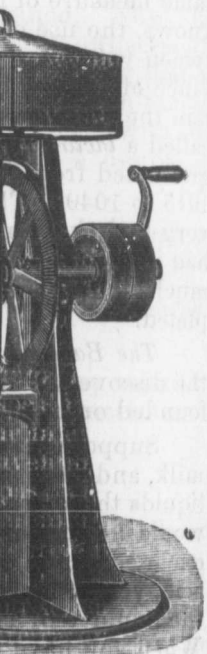
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*Measuring the sample.*—To measure a sample of milk, we must first be sure that the milk is thoroughly homogeneous, and to ensure this, it should be poured several times from one vessel into another, to incorporate the cream completely with the milk. Now, plunge into the milk the point of the pipette (fig. 2), which is a glass tube with an enlargement in the middle, and with a mark towards the top showing how high it has to be filled; this pipette will hold 17.6 cubic centimetres of milk (1).

While you are plunging the lower part of the pipette into the milk, suck with the mouth at its upper end, so as to draw up the milk above the mark; place a finger of the left hand under the lower end of the pipette, draw it out of the milk, with the fore-finger close the upper end, and keeping that end more or less shut with the fore-finger, allow the level of the milk to descend to the mark; you can thus be sure to have the exact volume of milk desired. Now, take one of the graduated bottles in the left hand, holding it gently sloping, introduce the point of the pipette into the neck of the bottle, leaning it against the interior side of the neck, and withdraw the fore-finger of the right hand from the upper opening of the pipette; the milk will then flow into the flask. This being done, wait a few seconds to allow the last drops of milk to gather together toward the bottom of the pipette, blow into it a little, to drive the last drops into the flask, and the sample of milk is ready. The same process is gone through with the different lots of milk to be tested, and, when all the bottles have received their samples, the re-agent, which, as we have said, is sulphuric acid, is to be added.

*The use of sulphuric acid.*—The acid employed is the ordinary commercial sulphuric acid, density or specific gravity of about 1.82 which can be verified by the areometer or acid-weigher, made on the same principle as the milk-weigher. Were the acid too weak, it would not dissolve the casein, and the butter could not disengage itself; if the acid were too strong, carbonaceous matter would be formed, and the butter itself would be attacked. Generally speaking, the acid met with in commerce possesses the requisite strength.

To use it, fill the glass measure, represented in fig. 3, up to the mark: this holds 17.6 cubic centimetres. The acid need not be measured with such nicety as the milk sample; according to our own researches, a little more or less acid does not exert much influence on the results. With the left hand, you will take one of the graduated bottles already charged with milk, then, holding it a little sloping, take with the right hand the glass filled with acid, and, leaning its spout on the mouth of the bottle, pour carefully into it all the acid in the bottle: and the same with the other

(1) The quantity of milk that flows into the flask is, in reality, only 17.5 cubic centimetres: but the pipette holds 0.1 of a cubic centimetre more, for it has been found that 0.1 c. c. of milk adheres to the interior surface of the pipette.

A cubic centimetre is about the 1/1000 of the old Canadian quart.

samples. The bottom of them round (perpendicular chocolate-b single grain must be taken poured into them: the fugal machine.

*The Balance* in motion as is sometimes able to revolve along the or pouches whose number in the small are made to are placed, crank. In the and Colonies requisite speed turbine-wheel, bason, or pressure machine. (and also works serves for the temper the milk; lamp under accident the acid were phuric acid

As the ment of its such as those the bottles, movable ste to the centre is at rest, the water in the

(1) Where means of a sip

samples. This having been done, take the bottles one after the other by the bottom of the neck and mix the acid and milk well together by shaking them round (horizontally), but taking care not to shake them up and down (perpendicularly), until the mixture, which will get very hot, assumes a chocolate-brown hue and the whole of the curd is dissolved. Not one single grain of the curd must be visible in any part of the flask. Care must be taken not to shake the bottles until the sulphuric acid has been poured into every one of them, in order to profit by the heat developed in them: the bottles should then be placed as soon as possible in the centrifugal machine.

*The Babcock centrifugal tester.*—The machine (see cut p. 98) can be put in motion either by hand-power or by a belt attached to a steam-engine, as is sometimes the case in large dairies. The principal part is a disc or wheel able to revolve horizontally at a great rate (700 or 800 revolutions a minute); along the spokes (*radii*) of this wheel are soldered cylindrical sheaths or pouches intended to receive and retain in their places graduated bottles, whose number varies, according to the size of the apparatus, from 4 bottles in the smallest to 60 in the largest size; those most frequently employed are made to hold from 10 to 20 bottles. The wheel, in which the bottles are placed, receives its motion through a belt or gearwork moved by a hand-crank. In the Babcock machine bought by the Department of Agriculture and Colonisation, made by Messrs. Fargo & Co, Lake Mills, Wisconsin, the requisite speed is obtained by turning the crank 75 times a minute. The turbine-wheel does not work in the open air; it is enclosed in a round tin bason, or preferably one made of copper, which is fixed to the frame of the machine. This bason, which is provided with a large moveable cover (and also with a small tap at a point in its circumference near the bottom), serves for two purposes: 1. hot water may be poured into it to keep up the temperature at a degree which will ensure the success of the test of the milk; if the water is too cool, it can be warmed up by placing a lamp under the bottom of the bason; 2. to protect the operator from any accident that may occur; for instance, if one of the bottles full of burning acid were to break: it must not be forgotten that burns caused by sulphuric acid are very serious. (1)

As the Babcock is not patented, many makers have varied the arrangement of its parts more or less advantageously. Thus, in one or two models such as those made by D. H. Roe & Co., the cylindrical pouches that hold the bottles, instead of being fixed on the turbine-wheel, are soldered on movable stems united by joints (*articulations*), or, more simply, by a hook, to the central disc of the turbine, in such a manner that, when the machine is at rest, the bottles occupy a vertical position [and may dip into the hot water in the bason], but as soon as the machine is going at full speed, they

(1) Wherefore, when I make superphosphate, I always empty the carboys of acid by means of a siphon, so that there may be no splashes.—A. R. J. F.

bottles rise into a position almost horizontal. This arrangement is, in our opinion, an improvement, but it is not indispensable. Whichever system is adopted, the test of the milk is proceeded with as follows :

*First operation [turbinage].*—As we saw just now, the graduated bottles containing the mixture of milk and acid were placed in the pouches of the turbine. The bottles bear a ticket on a copper ring, the numbers on which correspond with the different milks under test. If more than 10 or 12 tests are carried on at once, it is absolutely necessary that hot water be put into the bason at the beginning of the operation ; in every case, the temperature of the bottles and of their contents, from the beginning of the operations up to the end of the reading off of the results, must not be allowed to fall below 100° F., and it is advisable that the water in the bason be at a temperature of 200° F., before the bottles be placed in the machine.

The bottles being carefully placed in the very bottom of the cylindrical pouches, the cover is put on the bason and the machine set in motion so that it may quickly attain a speed of about 700 revolutions a minute, which speed should be kept up for 6 or 7 minutes. The effect of this rotation is to completely separate the butter from the rest of the liquid, so that, after the stoppage of the machine, the butter is found floating by itself on the top in the form of an oily layer more or less thick. The machine having been stopped, the cover is lifted off, and the bottles are filled up with hot water ; an operation that may be done at once, *but better at two different times, with a fresh rotation of the turbine between them.* The bottles, then, are taken out one by one and hot water is poured into them *very carefully* until the layer of butter, which rises by degrees into the neck of the bottle, arrives within the limits of the graduated scale. I say *very carefully*, because the butter must not be allowed to rise too high, that is, above the graduation, since that would vitiate the experiment. Generally, it is so managed that the upper level of the butter reaches nearly the figure 7 or 8 of the scale. The hot water used can be withdrawn from the bason by the tap, or any hot water can be employed by the use of the pipette or the graduated glass, &c. After having thus filled all the bottles and replaced them in the turbine at once, the cover is put on again and a second *turbinage* given.

*Second turbinage.*—This is meant to completely gather the fatty matter into the graduated neck of the bottle and thus to enable us to estimate its quantity exactly. This second *turbinage* (which, when two separate additions of hot water to the bottles are made, is followed by a third only lasts one minute ; and then the reading off of the results follows in haste.

*Reading off the results.*—We have now succeeded in isolating the fatty matter of the milk and have brought the whole of it into the contracted neck of the graduated bottle, where it appears in the form of a little cylinder of oil, in colour a yellow more or less pale ; its lower extremity is almost level (*plane*) or flat, and, if the test has been well conducted, it

forms a very upper extremity the glass-tube form, and n taken to observe point of the graduation of tion.

We must scale of the b ing lines represent fatty matter in upper and lower subtract the l of milk we ha number 8.30, 4.20 % of fat

Instead c seems to us to layer of butter on the graduated limb : this nu

*A word o* at a most imp matter contain get out of it ? by the Babcock that if the Ba made from 10 the Babcock t not pure fatty and that the hand, we know the great deg the whole of t able loss. It maker depends ever that may pond with 4°

forms a very distinct line of demarcation from the liquid below it. The upper extremity, owing to the effect of capillary attraction exercised by the glass-tube, instead of being flat, presents a hollowed surface of this form, and may be the occasion of erroneous calculations, unless care be taken to observe that the upper extremity is determined, not by the lowest point of the hollowed surface, but by the *sides*, which are higher, for the graduation of the scale has been constructed in accordance with that intention.

We must also remember that that the figures 1, 2, 3, 4, &c., on the scale of the bottle represent 1, 2, 3, 4, &c., per cent., and that the intervening lines represent 0.20 per cent. So that, to read off the percentage of the fatty matter it will be sufficient to note in what points of the scale the upper and lower extremities of the layer of butter are situated, and to subtract the lesser number from the greater. For instance, if in the sample of milk we have just been testing, we find at the upper extremity the number 8.30, and at the lower 4.10, by subtracting 4.10 from 8.30, you find 4.20 % of fatty matter.

Instead of proceeding in this way, a method may be employed which seems to us to be easier and more speedy. We measure the depth of the layer of butter with a pair of compasses [fig. 4], apply the lower limb to the 0 on the graduated scale, and read off the number indicated by the upper limb: this number is the true percentage sought.

*A word of explanation on the result obtained.*—Now, then, we have got at a most important result: the knowledge of the exact quantity of fatty matter contained in the sample of milk. How much butter would a maker get out of it? Would it be the exact quantity of the fatty matter indicated by the Babcock? Some *crazy* people will reply [as we have been told lately] that if the Babcock test be exact, the same quantity of butter should be made from 100 lbs. of milk as the percentage of fatty matter indicated by the Babcock test. But we know perfectly well that butter, as made up, is not *pure* fatty matter, since it contains on an average, only 85 % of the latter, and that the remaining 15 % consists of water, salt, &c. On the other hand, we know that the processes of skimming, churning, &c., in spite of the great degree of perfection at which they have arrived, do not utilise the whole of the fatty matter of the milk: there is always some considerable loss. It may be said, too, that on the greater or less skilfulness of the maker depends the yield of butter from a given quantity of milk. However that may be, we may admit that 3.60 % of fatty matter should correspond with 4 % of made up butter.

H. NAGANT.

## LECTURE BY M. A. LOND.

## TESTING MILK BY BABCOCK'S CENTRIFUGAL TESTER.

M. Nagant has just shown us, practically, the Babcock tester, which enables us to judge by ourselves of its indisputable usefulness, first, in paying each patron according to the quantity of butter contained in the milk he takes to the factory, and, next, as a means of detecting every species of fraud : whether it be committed by skimming ; by retaining the *strippings*, or by adding to it water or any other extraneous matter. With the Babcock tester, every one ought to receive the true value of what he takes to the factory. And, besides, every one is in a position to ascertain the richness of the milk yielded by his herd, and even by each individual cow in it, by testing with the machine the milk of each cow separately.

Since the Babcock tester has become common in the States, and has served to assure to each of the patrons his just due, a perfect revolution, pacific indeed, in the selection of cows has been brought about. To-day, at least where the Babcock is used, no farmer thinks of keeping a cow simply because she gives a great lot of milk : but every patron tries to get cows that give the greatest quantity of butter in the course of the year ; and so it happens that, with the same food and the same number of cows, no more than two-thirds or even one-half of the old quantity of milk is delivered at the factory ; and yet, on account of the richness of the milk in butter, more money is carried home than used to be. A gain, then, has been made in diminishing the total weight of milk taken to the factory, and another gain in the sum total of the money received.

Last December, even before my visit to the Burlington butter-school, I had satisfied myself, at the L'Assomption dairy-school, of the usefulness of the Babcock as a means of doing justice to each of the patrons. The milk varied often among my patrons from 3.40 to 5.20 hundredths of butter to the 100 lbs of milk, taking whole herds of from 8 to 10 cows. According to the usual way of paying, each of the patrons would have received the same sum for 100 lbs. of milk ; say, 4 lbs. of butter, or about 70 cents. net. Now, the Babcock showed that the milk of 5.20 richness was worth upwards of 50 0/100 more than the other of 3.40 ; in other words, the patron who brought the rich milk, was making a present to the patron who brought the poor milk, of more than 25 0/100 of the money which, nevertheless, belonged in full right to him.

I need not say that, by using the Babcock, satisfactory results will be invariably obtained, that is, results quite fair to each of the patrons, and that at every season of the year ; but on condition that the tester, be he maker or patron, do everything necessary to insure the proper action of the machine. To this I will add, that it is by no means necessary that the tester be an educated man. The machine tells its tale plainly enough (*parle aux yeux*). It is enough, if the rules given for these investigations

be followed, in which the judge of the greater will say : here is one cent, or by 2, or 3, on the vial.

I trust I have told you the Babcock, in recommending them to produce the same quantity and

Now remains to tell you this new implement and the creamometer use of these instruments. I lately recommended conceived this present made in my presence and specialists at Burlington the report, differences be followed in various not trouble you at making, with the according to the richness down in the printed

Without aiming I would ask the rich they may perhaps find held in the States, attention, the Babcock method at cheese-factories, its richness in butter between two milks, practice.

In the manufacture to be derived from the of butter remaining instrument capable chemical analysis conditions are hardly possible. I have myself found that is, that as much in the buttermilk, the use of the Babcock make the persistent pensable. When or



be followed, in which case the eye alone of the operator will be able to judge of the greater or less richness of the milk in butter. The eye, then, will say: here is one milk richer than the other by one-tenth of one per cent, or by 2, or 3, or 4 tenths, &c., according to the marks clearly indicated on the vial.

I trust I have thoroughly shown all the benefits to be derived from the Babcock, in rendering full justice to each of the patrons, and encouraging them to produce the greatest possible quantity of butter from the same quantity and quality of food.

Now remains the question of determining frauds solely by the aid of this new implement, instead of employing for that purpose the lactometer and the creamometer. Without by any means wishing to depreciate the use of these instruments, the employment of which I have always, till lately, recommended, I must avow my preference for the Babcock. I have conceived this preference in consequence of thousands of experiments made in my presence. Besides, it is the decided opinion of the professors and specialists at Burlington. I shall add to this, for the printed copy of the report, different formulæ which demonstrate exactly the processes to be followed in various cases of fraud, in a variety of seasons, &c. I shall not trouble you at present with those formulæ which must be used in making, with the Babcock, the necessary dividends in paying patrons according to the richness of their milk. These formulæ will be clearly laid down in the printed report.

Without aiming at departing from my position as a maker of butter, I would ask the makers of cheese to allow me to give them one hint that they may perhaps find useful. From all that I can learn from the opinions held in the States, and even in Canada, by specialists of the highest reputation, the Babcock may, and even must be used to settle the price of milk at cheese-factories, since the value of that milk is specially determined by its richness in butter-fat, and any difference that may exist in the *casein* between two milks, equally rich in fatty matters, is hardly appreciable in practice.

In the manufacture of butter there is another most important service to be derived from the Babcock: the exact determination of the quantity of butter remaining in the buttermilk after churning. I know of no other instrument capable of indicating this in a practical manner. Of course chemical analysis would do it, but in practice, these scientific determinations are hardly possible in a creamery, however well fitted up it may be. I have myself found in buttermilk quantities varying from 0.05 to 0.60, that is, that as much as 6 lbs. of butter in the 100 lbs. may be left behind in the buttermilk, without its being easily discovered, unless a constant use of the Babcock is persisted in. Such losses, in the churning alone, make the persistent use of this implement in all creameries almost indispensable. When once people have become accustomed to it, the payment

for milk according to the *data* of this implement will become unavoidable, owing to all the uses it may be applied to in accordance with what I have just stated.

And there is still another duty to be discharged by this tester in all creameries: the control of milk skimmed by the centrifugal separator. It is well known that the different separators recommended to-day do their duty perfectly, but it is on condition that they are perfectly managed. Now, a heap of cases may occur where the milk is not perfectly skimmed, from some cause or another, in spite of all the skill of the dairyman. By using the Babcock in testing the skim-milk, the butter-maker will be warned of a defect in the separator that demands correction.

Lastly, Gentlemen, let me draw your attention to the number of problems, and of difficult questions to be solved, with which we meet in our business as makers of butter or cheese, and which no less affect the farmer in his endeavours to produce a rich and abundant milk in the most economical fashion. The most skilful and best instructed men themselves admit that, after so many years of study and practice, what they have acquired perfectly is next to nothing in comparison with what they are striving to know, even in their special profession or art. The knowledge that man may attain to is infinite, our talents, our intelligence, our acquirements, are finite. Who would have dared to tell us, fifteen years ago, that a machine would be invented, costing at most a few dollars, to separate milk warm from the cow, and to convert it into cream and the cream into butter? Who would have dared to predict that a little instrument, costing at most a few dollars, would be invented which would put an end to all fraud on the part of the patrons, and would enable us to find in a few minutes the exact contents in butter of the milk of any one of our cows? This shows us how infinite is the range of science, and we see that it is our duty to continue to gain information from day to day; to study, to make experiments, and to search after those things that will make us better manufacturers, better and therefore richer farmers.

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*How to detect frauds in milk—Formulae for the analysis of milk at the factory by means of the Babcock Tester and the Lactodensimeter.*

The method of using the Babcock tester and the lactodensimeter in the detection of adulterated milk must be very interesting to those who are actively concerned in the dairy-business.

The Babcock is specially designed for the determination of the quantity of butter-fat contained in the milk of a whole herd of cows, or of each individual composing it. Its value can be greatly increased by the intelligent use of a correct lactodensimeter, and by the application of certain

formulae constructed  
matters contained in

If the Babcock employed, and if no tions of the given detected, and its con solids not fat—laid d of the milk; thus ac fivefold.

These formulae : analyses, which hav the gravity of milk b matters raises it by a

*Formula f*

The elements of  
T. signifying : to  
G. " : b  
L. " : in

The formula is  
1. 2 multiplied by F,

f Suppose, for exa  
t at and 32 by the l  
thus : 1. 2 multiplied  
plus 8 equals 12.80%

*Formula for*

The following is  
T and F of the p  
And Sp. G. Sr.,  
The formula is v  
gravity of the serum

Let us take once  
F=4; then, applying

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[1] Serum is the liquid  
In the milk of a herd, the

formulae constructed for the purpose of calculating the quantity of the solid matters contained in milk, and other *data*.

If the Babcock and the lactodensimeter be carefully and wisely employed, and if no error be allowed to insinuate itself into the calculations of the given formulæ, the adulterations of milk can be clearly detected, and its contents, not only in butter-fat, but also in total solids—solids not fat—laid down, together with the specific gravity of the serum of the milk; thus acquiring a certainty of correctness not only double but fivefold.

These formulæ are the results of the calculation of several thousand analyses, which have proved that each hundredth part of fat (1 ‰) lowers the gravity of milk by 0.001, and that each hundredth (1 ‰) of other solid matters raises it by a little less than 0.004.

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*Formula for calculating the whole solid matters in milk.*

The elements of the formula are :

T. signifying : total solids ;

G. “ : butter-fat, indicated by the Babcock ;

L. “ : indication of the lactodensimeter.

The formula is thus written :  $T = 1.2 F + \frac{32}{4}$ , and reads : T equals 1.2 multiplied by F, plus L divided by 4.

Suppose, for example, a sample of milk shows by the Babcock 4 ‰ of fat and 32 by the lactodensimeter : the formula would, in figures, stand thus : 1.2 multiplied by 4 equals 4.80 ; 32 divided by 4 equals 8 ; and 4.80 plus 8 equals 12.80 ‰ : this would be the *total solids*.

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*Formula for calculating the specific gravity of the serum [1].*

The following is the formula :

T and F of the previous formula.

And Sp. G. Sr., that is specific gravity of the serum.

The formula is written :  $\text{Sp. G. Sr} = 3.81 (T - F)$  and it reads : specific gravity of the serum is equal to 3.81 multiplied by T minus F.

Let us take once more the above example where we had :  $T = 12.80$   $F = 4$  ; then, applying our formula, we have :

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[1] *Serum* is the liquid portion of the milk after the solid matters are removed. A. R. J. F.  
In the milk of a herd, this specific gravity should never fall below 32, and never rise above 40.

$T - F$  (serum) =  $12.80 - 4 = 8.80$ , therefore : Sp. G. Sr. =  $3.81 (T - F)$  is equal to the specific gravity of the serum, that is equals :  $3.81 \times 8.80 = 33.5$ .

The two previous formulæ have given the elements :

T = total solids ;

F = do fat ;

L = lactometer a specific gravity of the whole milk ;

D. Sp. G. Sr. = specific gravity of serum.

To verify the fivefold result mentioned above, let us add, by deduction,

$T - F = T. S. Ss. G. =$  solids not fat.

In order to facilitate the apprehension of the service that the combined use of the Babcock and the lactodensimeter can afford us, let us now make a new application of the two previous formulæ :

The supposed sample of milk has shown by the Babcock 4.00 of fat, and by the lactometer, 32; that is,  $F = 4$  and  $L = 32$ .

The first formula is thus written :

$T = (1.2 \times 4) + \frac{32}{4} = 12.80$  ; and reads thus ; total solids equal 1.2 multiplied by 4—that is 4.80  
Plus 32 divided by 4, that is 8.

Total..... 12.80

The second formula is written :

Sp. G. Sr. =  $3.81 (12.80 - 4) = 33.5$  ; which reads : *Specific gravity of the serum equals :*

3.81 multiplied by 12.80—4,—or by 8.80	
8.80	
—	
300	
3048	
3048	
—	
33,5280	

And<sup>o</sup>co

The Babcock  
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And the deduc

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And, concisely rendered we have the fivefold result mentioned :

The Babcock	gave us.....	Total fat.....	F. = 4.
The lactometer	" ".....	Sp. gravity of the whole milk.....	L. = 32.
The 1st formula	" ".....	Total solids.....	T. = 12.80.
The 2nd "	" ".....	Sp. gravity of the serum.....	Sp. g. Sr. = 33.50.
And the deduction (1-F) "	" ".....	Total solids not fat.....	T. S. not F. = 8.80.

If water has been added to the milk, it is shown in the five determinations which will be more or less diminished ; if the milk is very rich, the addition of water is shown in solids not fat (T. S. not F.) and the gravity of the serum (Sp. G. Sr.)

Skimming diminishes the fat (F.), does not at all affect the solids not fat (T. S. not F.), and would increase the gravity of the serum (Sp. G. Sr.) and of the milk. (Sp. G. L.)

The skimming of, and the addition of water to, the same sample are shown by the lowering of the total of the solids (T.) and of the fat (F.), the gravity of the milk remaining almost the same ; and by the lowering of the total solids without fat (T. S. not F.) and the gravity of the serum (Sp. G. Sr.)

I must add, that in using the lactometer in testing the gravity of milk the tests must always be made at a temperature of 60° F., as all trustworthy lactometers are verified at that temperature. When milk is cold it weighs more, when warm, less. But as the operation of warming or cooling samples to bring them all to the same given point is very long and troublesome, I will add for this purpose a table, which will enable any one to test his milk with the lactometer at every degree of temperature from 45° F. to 75° F., and to arrive thus at the specific gravity of the milk with as much accuracy as if the samples were all brought to the same degree of temperature.



*Specific gravity of*

TABLE 1. A. FOR CORRECTING THE SPECIFIC GRAVITY OF MILK ACCORDING TO THE TEMPERATURE.

Degrees of the Lactometer.	degrees of the thermometer (Fahrenheit.)														
	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
20	19.	19.	19.1	19.1	19.2	19.2	19.3	19.4	19.4	19.5	19.6	19.7	19.8	19.9	19.9
21	19.9	20.	20.	20.1	20.2	20.2	20.3	20.3	20.4	20.5	20.6	20.7	20.8	20.9	20.9
22	20.9	21.	21.	21.1	21.2	21.2	21.3	21.3	21.4	21.5	21.6	21.7	21.8	21.9	21.9
23	21.9	22.	22.	22.1	22.2	22.2	22.3	22.3	22.4	22.5	22.6	22.7	22.8	22.8	22.9
24	22.9	22.9	23.	23.1	23.2	23.2	23.3	23.3	23.4	23.5	23.6	23.6	23.7	23.8	23.9
25	23.8	23.9	24.	24.	24.1	24.1	24.2	24.3	24.4	24.5	24.6	24.6	24.7	24.8	24.9
26	24.8	24.9	24.9	25.	25.1	25.1	25.2	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9
27	25.8	25.9	25.9	26.	26.1	26.1	26.2	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9
28	26.7	26.8	26.8	26.9	27.	27.	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9
29	27.7	27.8	27.8	27.9	28.	28.	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9
30	28.6	28.7	28.7	28.8	28.9	29.	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9
31	29.5	29.6	29.6	29.7	29.8	29.9	30.	30.1	30.2	30.3	30.4	30.5	30.6	30.8	30.9
32	30.5	30.5	30.5	30.6	30.7	30.9	31.	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.9
33	31.3	31.4	31.4	31.5	31.6	31.8	31.9	32.	32.1	32.3	32.4	32.5	32.6	32.7	32.9
34	32.2	32.3	32.3	32.4	32.5	32.7	32.9	33.	33.1	33.2	33.3	33.5	33.6	33.7	33.9
35	33.	33.1	33.2	33.4	33.5	33.6	33.8	33.9	34.	34.2	34.3	34.5	34.6	34.7	34.9

TABLE 1. B. FOR CORRECTING THE SPECIFIC GRAVITY OF MILK ACCORDING TO THE TEMPERATURE.

Degrees of the Lactometer.	Degrees of the thermometer [Fahrenheit.]														
	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74
20	20.1	20.2	20.2	20.3	20.4	20.5	20.6	20.7	20.9	21.	21.1	21.2	21.3	21.5	21.6
21	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	22.	22.1	22.2	22.3	22.4	22.5	22.6
22	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	23.	23.1	23.2	23.3	23.4	23.5	23.7
23	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	24.	24.1	24.2	24.3	24.4	24.6	24.7
24	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.9	25.	26.1	25.2	25.3	25.5	25.6	25.7
25	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.9	26.	26.1	26.2	26.4	26.5	26.6	26.8
26	26.1	26.2	26.3	26.5	26.6	26.7	26.7	27.	27.1	27.2	27.3	27.4	27.5	27.7	27.8
27	27.1	27.3	27.4	27.5	27.6	27.7	27.8	28.	28.1	28.2	28.3	28.4	28.6	28.7	28.8
28	28.1	28.3	28.4	28.5	28.6	28.8	28.8	29.	29.1	29.2	29.4	29.5	29.7	29.8	29.9
29	29.1	29.3	29.4	29.5	29.6	29.8	29.9	30.1	30.2	30.3	30.4	30.5	30.7	30.9	31.
30	30.1	30.3	30.4	30.5	30.7	30.8	30.0	31.1	31.2	31.3	31.5	31.6	31.8	31.9	32.1
31	31.2	31.3	31.4	31.5	31.7	31.7	31.8	32.	32.2	32.4	32.5	32.6	32.8	33.	33.1
32	32.2	32.3	32.5	32.6	32.9	32.9	33.	33.2	33.3	33.4	33.6	33.7	33.6	34.	34.2
33	33.2	33.3	33.5	33.6	33.8	33.9	34.	34.2	34.3	34.5	34.6	34.7	34.9	35.	35.2
34	34.2	34.3	34.5	34.6	34.8	34.9	35.	35.2	35.3	35.5	35.6	35.8	36.	36.1	36.7
35	35.2	35.3	35.5	35.6	35.8	35.9	36.1	36.2	36.4	36.5	36.7	36.8	37.	37.2	37.3

The results of checked, at the ex a rule, turn out to

The first formu formula for calcul Professor Hills, of published or taught

The second form Wisconsin dairy-sc

As soon as the without difficulty, if the milk brought

Still, it is nece by a disinterested p sending doubtful m to be normal, the fir like the first, the at herd, either as rega

For some years using which we co in the milk brought as is the general pr

With the novel milk by the Babcoo the manner of recko

Here is an insta  
A brings 645 lb  
B 389  
C 1,000

All the others,  
A is credited w  
B "  
C "  
The others

The receipts of  
The butter-mak market. Suppose t making it be 4 cts.,

The results obtained by the use of these formulæ have been frequently checked, at the experiment-bureau, with actual chemical analysis, and, as a rule, turn out to be exactly the same.

The *first formula* was calculated and simplified, after an able English formula for calculating the fatty matter in the solids and the gravity, by Professor Hills, of Burlington, Vt., and I believe it has never been either published or taught before.

The *second formula* was calculated and taught by Dr. Babcock, of the Wisconsin dairy-school.

As soon as these formulæ are well understood, they can be used without difficulty, and with great advantage to any one desirous of seeing if the milk brought to the factory has undergone any adulteration.

Still, it is necessary to get a true and fair sample, taken at the farm by a disinterested person, before accusing any proprietor of dishonesty in sending doubtful milk to the factory. Should the second sample be found to be *normal*, the first must have been adulterated; but if it be exactly like the first, the abnormal result must be due to some peculiarity in the herd, either as regards their food or to some other like cause.

#### PAYMENT FOR MILK AT THE FACTORY.

For some years, we have felt the want of a method, short and easy, by using which we could pay the patrons according to the quantity of butter in the milk brought to the factory, instead of paying them for its weight, as is the general practice in the factories.

With the novel system of determining the amount of butter-fat in the milk by the Babcock process, we shall have to make a few alterations in the manner of reckoning.

Here is an instance :

A brings 645 lbs. of milk containing 4.20 per cent of fat.

B        389        "        "        4.75        "        "

C        1,000        "        "        3.50        "        "

All the others, together, bring 8,000 lbs. of milk containing 4% of fat.

A is credited with  $645 \times 4.20 = 27.09$  lbs. of fat.

B        "        "         $389 \times 4.75 = 18.48$         "        "

C        "        "         $1,000 \times 3.50 = 35.00$         "        "

The others        "         $8,000 \times 4.00 = 320.00$         "        "

The receipts of the week are        400.57        "

The butter-maker finds that he has made 424 lbs. of butter ready for market. Suppose this butter fetches 21 cts. a pound and the charge for making it be 4 cts., then :

G TO THE

	57	58	59
7	19.8	19.9	19.9
7	20.8	20.9	20.9
7	21.8	21.9	21.9
7	22.8	22.8	22.9
6	23.7	23.8	23.9
6	24.7	24.8	24.9
6	25.7	25.8	25.9
6	26.7	26.8	26.9
6	27.7	27.8	27.9
6	28.7	28.8	28.9
6	29.7	29.8	29.9
5	30.6	30.8	30.9
5	31.6	31.7	31.9
5	32.6	32.7	32.9
5	33.6	33.7	33.9
5	34.6	34.7	34.9

G TO THE

	73	74	75
21.3	21.5	21.6	
22.4	22.5	22.6	
23.4	23.5	23.7	
24.4	24.6	24.7	
25.5	25.6	25.7	
26.5	26.6	26.8	
27.5	27.7	27.8	
28.6	28.7	28.8	
29.7	29.8	29.9	
30.7	30.9	31.	
31.8	31.9	32.1	
32.8	33.	33.1	
33.6	34.	34.2	
34.9	35.	35.2	
36.	36.1	36.	
37.	37.2	37.3	

$424 \times 21 = \$89.04$ , total sales of butter.

$424 \times 4 = 16.96$ , cost of making.

$\$89.04 - \$16.96 = \$72.08$  for dividends to the patrons.

$72.08 \div 400.57 = 0.18$  as price of each pound of fat brought to the factory.

A is credited with 27.09 lbs of fat.....	27.09	$\times 18 =$	$\$ 4.87$
B " " 18.48 " .....	18.48	$\times 18 =$	3.32
C " " 35.00 " .....	35.00	$\times 18 =$	6.30
The rest" 320.00 " .....	320.00	$\times 18 =$	57.60

\$72.09

These few notes will prove very useful to those who already know how to arrange the ordinary dividends between the patrons.

AIMÉ LORD,

Professor at the l'Assomption Creamery.

#### DISCUSSION ON THE LECTURES OF MM. NAGANT AND LORD.

*M. Préfontaine.*—I should be glad if M. Nagant and M. Lord, who have just given us such a capital description of the Babcock, would kindly clear up for me one or two doubtful points in the use of this machine. We bought one of them this summer, when my brother and I went to Burlington; there, experiments were made with it in our presence; each of the pupils, after having taken two samples of the same milk, made an experiment by himself, and neither of the results agreed with the others. I should like to get some explanation on this point.

*M. Lord.*—In the experiments made with the Babcock at Burlington, differences arose pretty frequently between the results from samples taken from the same milk, from samples taken even from the vat itself. The milk was mixed as well as possible; each pupil took his sample and made his test. There was an average difference of from fifteen hundredths to one per cent on the same samples. Just consider the difference that would make, and you will see that it is very trifling, very insignificant indeed, especially when one looks at the calculation of the payment of the patrons, and it is that, I fancy, that you want to get at. In comparing the milk of different patrons, it happens pretty often that one is twice as rich as another. As I said just now, I have found from  $3.40\%$ , and even  $3\%$  (but not often), to  $5.20\%$ ; that is, nearly double. Even if the Babcock made a little difference of one-tenth of  $1\%$  on milk of the same sample, this is so tiny in comparison with the richness of the milk, that no one ought to attach much importance to it; not even if there were found to be a difference of from 5 to 10 hundredths of  $1\%$ .

*M. Préfontaine.* which each pupil operation had been would not have occ

*M. Lord.*—The

*M. Préfontaine.*

*M. Lord.*—Cert all of the same size

*M. Préfontaine.*— six or seven pupils, at the same result. be attributed to the

*M. Lord.*—The there may have been

*M. Nagant.*—I h same milk and I hav results. I have not hundredths, of 1 per is, of course, a cause. ing a sample of mil pipette, may not alwa time, a part of the m not much indeed, b quantity of acid is n signify much; still, i given in explanation may say then that this of one per cent. Tha lead to mistakes. It differences of degrees than 15 hundredths out to mathematical c dairying.

*M. Bernatchez.*— in \$100.00 ?

*M. Chapais.*—Yes cent each in \$100.00.

*M. Nagant.*—Doe enors of 1 hundredth happens; even in the most careful work; su



*M. Préfontaine.*—The error may perhaps be attributed to the way in which each pupil took his sample or managed his test. If the whole operation had been carried on by the same person, perhaps the difference would not have occurred.

*M. Lord.*—The error probably was from some such cause.

*M. Préfontaine.*—Are the fatty matters in the milk all of the same size?

*M. Lord.*—Certainly not; the fatty matters [*globules*? Trans.] are not all of the same size; hence, the difference in the tests of the same milk.

*M. Préfontaine.*—Of course, my brother found it strange that out of six or seven pupils, all taking samples out of the same milk, no two arrived at the same result. According to M. Lord and me, this discrepancy may be attributed to the manner of conducting the operation.

*M. Lord.*—The fatty matters in the milk not being all of the same size, there may have been a difference in richness.

*M. Nagant.*—I have made, once or twice, comparative tests with the same milk and I have found, as M. Lord says, a trifling difference in the results. I have not the tables here, but the difference did not exceed 15 hundredths, of 1 per cent. Whence do they come, these differences? There is, of course, a cause, and I think I can lay my finger on it. First, in taking a sample of milk, the quantity taken, even with the very cleanest *pipette*, may not always be the same. If you let it drain, for more or less time, a part of the milk will remain in the *pipette*, sticking to the glass; not much indeed, but enough to affect the result. Besides, the exact quantity of acid is not always used. I said, it is true, that this did not signify much; still, it has some effect. These are two good reasons to be given in explanation of the difference of 15 hundredths of 1 per cent. We may say then that this apparatus is erroneous to the extent of 15 hundredths of one per cent. That is a very slight error; still, it is a real one, and may lead to mistakes. It does not affect our manufacture much, because the differences of degrees in the richness of milk are always infinitely greater than 15 hundredths of 1 per cent, and, if the analysis of milk were carried out to mathematical correctness, it would not be of much use in practical dairying.

*M. Bernatchez.*—Are not 15 hundredths of 1 per cent equal to 15 cents in \$100.00?

*M. Chapais.*—Yes, of course; it comes to this: to find 15 pieces of one cent each in \$100.00.

*M. Nagant.*—Does not the exact chemical analysis of milk often make errors of 1 hundredth and even of 10 hundredths of 1 per cent? This often happens; even in the analysis of the most skilful chemists, in spite of the most careful work; such errors occur frequently. It seems to me that if,

theoretically speaking, the machine be not absolutely perfect (and what is perfect in this world?) it is perfect enough to answer well in practice, and much better than anything we have had heretofore.

*M. Lord.*—One word in support of M. Nagant's statement; M. Bruneau has just made the calculation, and finds the difference, of which I spoke, would cause a loss of one pound of butter in 600 pounds.

*M. l'réfontaine.*—I thought the difference was greater than that.

*M. Thivierge.*—I have a simple question to ask. Can those interested in the matter, ask questions, although they are not members of the association?

*M. Tache.*—Certainly.

*M. Thivierge.*—I will, then, ask Mr. Barnard this: when he speaks to us of 15  $\frac{1}{100}$  per hundred dollars.....

*M. Barnard.*—I never said 15 per cent; I said 15 cents per \$100.00. That is 15 hundredths of 1 per cent.

*M. Thivierge.*—I understood it was 15 per cent per hundred dollars.

*Mr. Barnard.*—That is impossible; 15 per cent would represent 15 dollars on the hundred dollars; what is meant is equal to 15 cents on the \$100.00.

*A Maker.*—It is well known that in the milk that is taken to factories there are sometimes frauds practised. I should like to know, from these gentlemen, if we can depend upon the results given by the Babcock, or if, in cases of fraud, we can rely entirely on it? One might have to go into Court, and it is not easy for a man to go into Court and swear to a thing about which he is not certain.

*Mr. Barnard.*—I will answer this question. I have just returned from the State of Vermont, where I was told that all the American tribunals recognise the Babcock as a fully sufficient authority. In a factory, where they make 10,000 lbs. of butter a day [some of those present, who have "been to school" at Burlington, have seen this enormous factory, the largest in the world], in this central factory at St. Albans, are brought together the separator skimmings of 46 different centres; and the patrons of all these 46 factories, brought together into one principal one, receive payment for their milk on its value, calculated by means of the Babcock. The patrons admit that the Babcock is trustworthy. Nowadays, a butter-maker advises his patrons to change his cows, and the patrons do change their cows. They go and find farmers who supply cheeseries where the Babcock is not in use, and they say: "Here! I have a cow that gives lots of milk, but it is not rich in butter; she'll answer your purpose at the cheesery; hand me over a cow that gives less milk than mine but more butter"; and the "swap" is made. But now, the cheese-makers begin to

see that they, after also use the Babcock which took place milk according to paid for, in cheese Babcock's decision

*M. Thivierge.* Barnard; but here Can we depose upon One is obliged, no Can we place entiretical question.

*M. Bernatchez* at once, it is as much prosecution.....

*M. Thivierge.* one we have here. full confidence in the from the inventor, accuracy of the Babcock over it; but I simply

*M. Taché.*—It may be used for the or, for the detection be employed in any patrons agree to the of the quality of the more a question of which you are to judge have heard told you old instruments. If you fear that the satisfactory, you have combine the use of recognises officially when properly applied quote you the clause very of milk. It is follows:

"7. Proof of conviction of having committed this act, it will be a conviction, to show

see that they, after the results that have been obtained in Vermont, must also use the Babcock; and at the annual meeting of their association, which took place this month, the makers admitted that, in paying for the milk according to its real value, and to prevent frauds, it must be also be paid for, in cheese-factories as well as in creameries, according to the Babcock's decision.

*M. Thivierge.*—I have the highest respect for the authority of Mr. Barnard; but here is a question essentially practical, as it concerns us. Can we depose upon oath in matters where the Babcock is our authority? One is obliged, now and then, to be very angry with some of the patrons. Can we place entire dependance on the Babcock? It is a thoroughly practical question.

*M. Bernatchez.*—When you are making tests for a number of patrons at once, it is as much in the interest of one as of the other, and if there is a prosecution.....

*M. Thivierge.*—I have used a similar machine, with 10 phials, to the one we have here. From the result I have obtained, I have never reposed full confidence in it, and even after following the instruction I received from the inventor, I would not *swear* in court, trusting to the perfect accuracy of the Babcock. This is a practical question; I will not dispute over it; but I simply ask the question.

*M. Taché.*—It may be regarded from two points of view: the Babcock may be used for the purpose of paying for milk according to its real value, or, for the detection of fraud. In the first case, it is clear that it will not be employed in any factory unless all the patrons consent. As soon as the patrons agree to the employment of this machine to determine the average of the quality of the milk, you have nothing more to seek for. There is no more a question of fraud concerned; they have admitted the machine by which you are to judge. As to the detection of fraud, those whom you have heard told you that they would not advise you to do away with the old instruments. Their use may be combined with the use of the Babcock. If you fear that the tribunals will not accept the Babcock as perfectly satisfactory, you have only to do one thing: keep on using it, and with it combine the use of the other instruments in your possession. The law recognises officially the employment of the lactometer and the cremometer, when properly applied. This the law declares in definite terms; I will quote you the clause 7 of the Federal Act, to prevent frauds in the delivery of milk. It is clause 7, chap. 43, act Vict. 52 of Canada, and reads as follows:

“7. *Proof of culpability.*—In order to establish the guilt of a person accused of having violated any one of the provisions of sections 1 or 2 of this act, it will be sufficient *prima facie* evidence on which to found a conviction, to show that the milk thus sent, sold, brought or supplied to a

factory as aforesaid, to be made into butter, cheese or condensed milk, is inferior substantially in quality to pure milk; provided that the tests be made by means of a lactometer or cremometer or any other instrument suitable to the performance of such tests, and that they be made by a competent person; nevertheless, a conviction may be established by any other legal evidence.

Suppose the indications of the Babcock have revealed to you a fraud, and that the patron be prosecuted, you are not called upon to say: "I swear positively that this person is guilty"; but you can say this without fear: "I appear as a witness, and I declare that I found such or such an indication with the Babcock." There is no counsel, having even only a moderate knowledge of his profession, who could not establish before a court the value of this machine, and cause the patron to be convicted.

*M. Bernatchez.*—Before adjourning for dinner, Mr. Barnard will give us a short lecture.

#### LECTURE BY MR. D. M. MACPHERSON.

(Mr. Barnard read, and commented on a lecture by Mr. D. M. Macpherson, translated from the English and entitled.)

#### THE PRODUCTION OF MILK IN WINTER.

Dairying is now recognised in Canada as one of the chief industries practised by the farmers, and all those who have watched its development, seen its influence, and profited by its results, acknowledge with satisfaction the practical and palpable benefits derived from its present method of exploitation.

From the organisation of co-operative creameries and cheeseries, up to the present time, every farmer has limited his efforts to the production of milk during only 6 or 7 months of the finest season of the year. The food most largely depended on for the cows is the grass of the pastures. During the rest of the year, the cows are dry, and receive as food the cheapest materials: straw, chaff, and a trifling ration of hay.

The first result of such treatment is that no return is had for the greater part of the labor bestowed on the cows. This *economy* of food is even pushed to such a point, by some, that it sometimes causes the loss of many head of cattle in spring, and the rest of the herd is frequently found, when that season arrives, in very sad case.

How to increase the *profits of the dairy*, and to lessen as much as possible the objectionable parts connected with the feeding and care of the stock; this is the object of the lecture I am about to deliver. I call it: *The Production of Milk in Winter, or, Winter Dairying.*

The application of the purpose of the entire year, has given and a practical method of useful information as well as from the or milk.

In studying the following questions

1. Can cows be kept in the province? If so, for how long?
2. Can cows be kept in the winter?
3. Can this "problem" be solved?
4. Which pay the most? Making butter or milk?
5. What are the best breeds?
6. What are the best feeds?
7. What are the best ways of feeding?
8. What is the best way of feeding at the least cost from the farmer's point of view?

These are the important questions of our subject, though not practical farmers.

Can cows be kept in the winter?

Cows can be kept in the winter from ten to eleven months, if given proper food, and the best ventilation, and sanitation. During the past few years, it has been proved this to be especially true in those cows, which were kept from 35 to 60 cents per head, both as to the quality and the bodily size and condition.

[1] A race is aboriginal instance: the Devon cow, Shropshire ewe are from a

The application of scientific methods to the feeding of cattle, either for the purpose of breeding, or the production of meat or milk, during the entire year, has greatly contributed to the adoption of winter dairying; and a practical man rearing, fattening beasts, or dairying, may gain much useful information from a knowledge of the chemical composition of food, as well as from the known requirements of animals yielding growth, meat, or milk.

In studying seriously the problem of the production of milk in winter, the following questions naturally arise:

1. Can cows be kept in milk longer than is usually the case in this province? If so, for how many months in the year?
2. Can cows be so fed, all the year round, as to give plenty of milk?
3. Can this "plenty of milk" be produced economically and profitably?
4. Which pays best in winter: breeding cattle or fattening calves? Making butter or making cheese?
5. What are the first conditions to be fulfilled in winter dairying?
6. What are the best breeds or races of milch-cows for our province?
7. What are the best kinds of food to be given to the cows, and what is the best way of treating them, to get the greatest quantity of milk at the least cost from them?
8. What is the most profitable use to be made of the milk?

These are the most important questions arising from an attentive study of our subject, though many more will present themselves to the minds of practical farmers.

#### FIRST QUESTION.

Can cows be kept in milk longer than is usually the case in this province? If so, for how many months in the year?

Cows can be kept in milk, and milked, without any injury, during from ten to eleven months of the year, provided they are given ample and proper food, and that their stalls be well arranged, as regards warmth, ventilation, and sanitary requisites.

During the past few years, I, together with many of my friends, have proved this to be emphatically true. During the last four years, I have kept from 35 to 60 cows in milk for from 10 to 11 months in each year. And those cows, which were really good milkers, have increased in yield of milk all the time, both as regards quantity and quality, and have improved in bodily size and condition.

[1] A *race* is aboriginal, so to speak; a *breed* is the production of one or more crosses. For instance: the Devon cow, and the Hampshire-down ram are from a race; a Shorthorn bull and a Shropshire ewe are from a breed. Trans.

## SECOND AND THIRD QUESTIONS.

*Can cows be fed the year round so as to give an abundant flow of milk? Can this abundance of milk be produced economically and profitably?*

To these questions I again reply in the affirmative: milch-cows can be made to give plenty of milk all the winter at the rate, let us say, of 16 to 20 lbs. a day, at a gross cost of 12 to 15 cents a day, or, deducting the value of the manure, 10 cents a day, net.

We can fairly calculate the value of the winter's milk at  $1\frac{1}{2}$  cent a pound, or at least \$1.12 $\frac{1}{2}$  the 100 lbs.; and the dung, if carefully saved, at 8 cents a day. Allow me to add, parenthetically, that Professor Roberts, of the Cornell University, New-York, has lately proved, in the most conclusive manner, that the manure of a properly fed milch-cow is worth at least 10 cents a day.

Now, taking a fair average yield of milk, 16 lbs. a day, at  $1\frac{1}{2}$  cent a pound, we have a daily return of 18 cents; adding to which 8 cents for the daily product of manure, we have 26 cents a day as the return for an expenditure in food of 12 cents: *net profit*, 14 cents a day.

Many farmers get better results than the above, but I have restricted myself to such an average as may generally be secured.

## FOURTH QUESTION.

*Which pays best in winter: to grow beef-cattle, to fat calves, to make cheese, or to make butter?*

I wish it to be understood that I have tried all these plans practically, and, after many experiments and calculations, I have made up my mind that nothing pays like *making butter in winter*, and the more so, since the skim-milk remains for the calves and hogs, the feeding of which is not without good results.

Cheese-making in winter would not pay as well; besides, it is more difficult to make good cheese than good butter at that season. Cheese-making I find more profitable in hot weather, and butter-making in cold weather: when butter can be sent to any market and be sure to arrive in good condition, while cheese would be subject to be injured by the frost in transit.

## FIFTH QUESTION.

*What are the first steps to be taken with a view to winter-dairying?*

The first step is to provide a good, large *cow-house*, and a *silo* to hold from 5 to 6 tons of silage for each cow-stall.

This *cow-house*

*Warm*,—having felt between each

*Roomy*,—The cattle easily, and the cleaning out of

The width of mangers, should be

For 1 row of c

For 2 "

For 4 "

There is no proposed width of

The *stalls* show two are kept in one

The *mangers* show greatly help in keep

*Well lighted*,—the cattle properly

*Well ventilated*,

air, is of the greatest throughout its length there at each end.

auger, two in front be equally divided to be made from the rapid passage of the cannot be attached fowl air, and no co thriving condition.

The greatest a liquid manure, so as of the greatest possible by the crops.

The thing next of food for the winter

The most useful ought to sow an a clover for every 8 or maize and  $1\frac{1}{2}$  to 2 $\frac{1}{2}$  for the production o

This *cow-house* must be :

*Warm*,—having double-boards outside as well as inside, with tarred felt between each tier of boards ;

*Roomy*,—There should be enough space in front of the mangers to feed the cattle easily, and, behind the cows, room enough for the milking and the cleaning out of the stalls.

The width of a cow-shed, with an alley for feeding in front of the mangers, should be :

For 1 row of cattle, 18 feet.

For 2 “ “ 34 “

For 4 “ “ 66 “

There is no greater error than to economise space in laying out the proposed width of a cow house.

The *stalls* should be 3 ft. 3 in. wide for each head, or 6 ft. 6 in. when two are kept in one stall.

The *mangers* should be raised 6 or 8 inches above the floor ; this will greatly help in keeping the cattle clean.

*Well lighted*,—Plenty of light will make it easier to feed and attend to the cattle properly.

*Well ventilated*,—The immediate replacement of the vitiated air by fresh air, is of the greatest importance. A good way to secure the renewal of the air, is to set a pipe or long wooden box above the feeding alley, throughout its length, extending to the outside of the building and opening there at each end. Holes are to be pierced in this pipe with a one inch auger, two in front of each beast, through which the fresh air can enter and be equally divided among all the cattle. Pipes, and wooden chimneys, are to be made from the floor above, projecting through the roof, to ensure the rapid passage of the impure air out of the stalls. Too much importance cannot be attached to thorough ventilation, for no animal can thrive in foul air, and no cow will give a full yield of milk, unless she is in a thriving condition.

The greatest attention should be paid to preserving the solid and liquid manure, so as to enrich the soil of the farm by the restoration to it of the greatest possible amount of the elements of fertility extracted from it by the crops.

The thing next in importance is the providing of a sufficient quantity of food for the winter, and of green-meat for silage.

The most useful fodder-plants are maize and clover. Every farmer ought to sow an acre of maize for every 4 head of cattle, and an acre of clover for every 8 or 16 head : this will give, for a herd of 20, 5 acres of maize and  $1\frac{1}{2}$  to  $2\frac{1}{2}$  acres of clover, and will ensure abundant provision for the production of milk in winter.

The *silo* should be built so as to be easy to fill and easy to feed out. The best way to preserve the wood-work of a silo is to make it so that it can be ventilated between the two outside and inside boardings. This can be done by having a loose board in the outer wall, to be raised in spring and closed before filling. This will afford a free passage to the air, and dry up the dampness formed in the dead air-space during the winter. Then, make a three-inch auger-hole on each side of the silo at the bottom, through both sides, so as to allow the air to pass into the inside in the summer, to dry it. These holes may be stopped, when the silo is about to be filled, and opened when it is empty.

There are three chief things to be kept in view when building a cow-house and a silo :

First : The entire preservation of liquid and solid manure ;

Second : The development and the maintaining of the health of the cattle ;

Third : Economy in labour and in expenditure.

With a cowhouse and a silo constructed as above described, a fourth element is wanted : the proprietor must be a man possessed of good average intelligence. No matter how perfectly the buildings and cow-houses may be arranged, unless an intelligent mind and an industrious hand guide the management, very little profit will be made. All things must be carried out in order ; otherwise, failure will be the result.

#### SIXTH QUESTION.

*What breed or race of milch-cows will best answer our purpose ?*

After having devoted a great deal of study and reflection to this point, I have come to the conclusion, after many contradictory experiments, that good selections of the native stock of the country, when well fed, as they should be, will give the most profitable results. The native cow is, in a measure, thoroughbred, as far as making the most of the food and care she receives. Everybody knows that, when what is called a *well-bred* beast is given the same food and treatment that a native gets, it often dies or falls away miserably in flesh, and soon becomes a wretched object, far worse than a native beast. But, on the other hand, when a native animal is well fed and cared for, its habits being of an economical turn, it gives the greatest result from such treatment, especially when milk is what is required from it.

I sincerely believe that a great future lies before that farmer who shall enter upon the creation of a herd of milch-cows, selected from the best specimens of the native cattle.

*What are the best trees*

A question very often asked, to give you a few ideas and experience.

*Treatment.*—Kilns are essential to the cow-house. They are also requisite. They are possible, but at any rate, and pure, cool but not dry.

*The food* should be composed of Maize and clover, in the basis of an excellent and valuable, and bran and shorts.

Here, in my opinion, is the best meat or milk, that can be made.

Maize  
Clover  
Straw  
Bran  
Shorts.

Ground { Oats...  
          { Barley...  
          { Pease...  
          { Cake, (

This should be done on a floor, covering the whole, and given to the cattle near the door. The meal, hay, and clover should be softened ; the meals should be given in the *nutritive ratio* of it as they can eat.

The cow-house should be kept clean. Now and then, I should like to see a day. They rest and

(1) *Nutritive ratio* is the ratio of the hydrates. It is thought best to give meadow hay, viz., 1 to 5.



## SEVENTH QUESTION.

*What are the best treatment and food for producing the most profitable returns in winter-dairying?*

A question very difficult to answer in a few words. Still, I will try to give you a few ideas on it which have been suggested to me by practice and experience.

*Treatment.*—Kindness and quietness and cleanliness are three qualities essential to the cowman. Regular milking and feeding, at stated hours, are also requisite. Cows should be curried and rubbed-down daily, if possible, but at any rate, once or twice a week. The water must be clean and pure, cool but not cold: 50° to 75° is about right.

*The food* should be various in kind, and changed from time to time. Maize and clover, in silage, are the very best succulent foods, and form the basis of an excellent ration. Carrots, potatoes, and roots in general, are valuable, and bran and oil-cake must not be forgotten.

Here, in my opinion, is one of the best rations for the production of meat or milk, that can be composed:

	Maize silage.....	50 lbs.
	Clover-hay.....	3 "
	Straw.....	5 "
	Bran.....	1 "
	Shorts.....	1 "
Ground	{ Oats.....	1 "
	{ Barley.....	1 "
	{ Pease.....	1 "
	{ Cake, (cotton seed, or linseed).....	2 "
		65 lbs.

This should be all carefully mixed over-night, spreading out the silage on a floor, covering it with the hay or straw chaffed, and then with the meal. The whole, when well mixed, is to be thrown up into a heap and given to the cattle next day. The best results flow from such a composition. The meal, hay, and straw imbibe moisture from the silage and become softened; the meals stick to the damp parts of the straw, silage, and hay. The *nutritive ratio* of this mixture is 1 to 5, or to 5.5; the cows get as much of it as they can eat. (1)

The cow-house should be cleaned out thrice, and always after milking. Now and then, I give the cattle long clover-hay, by itself, once or twice a day. They rest and chew the cud better for it.

(1) *Nutritive ratio* is the proportion between the digestible protein and the digestible carbohydrates. It is thought best, remarks Jules Crevat, to take the proportion as it exists in good meadow hay, viz., 1 to 5.

## EIGHTH QUESTION.

*What is the best way of disposing of the milk?*

To this I reply: by all means have the butter made in a creamery, where it will be properly dealt with. The modern *separators* do the skimming to perfection, and leave no cream behind them.

This winter, I have been trying a winter creamery on my farm, and very well pleased with it I am. I advise every dairy-farmer to take advantage of the profits it assures when well managed.

To these advantages, I may add two others, which my own experience makes me consider to be of the highest importance. The first is the improved value of the manure produced by well fed cattle, which brings about an increased fertility in the soil and a greater yield of crop; whence, arises an improvement in the selling value of the farm and in the profits of the business.

The second is the power of feeding, in addition to the milch-cows, a certain number of beef-cattle. The same hands required to milk and attend to so many cows, can employ the rest of their time in looking after twice that number of rearing or fattening beasts; whence, a new increase of profit arises in the production of butcher's meat and manure.

## CONCLUSION.

To render the work of our farmers more profitable, they ought seriously to put the following counsels into practice in the order in which I give them:

Build roomy cowhouses of the best kind, large enough to hold one head of cattle for each acre you have under cultivation.

Build one or more siloes proportioned to your stock.

Grow as much maize and clover as possible.

Rear more calves; feed your stock better; fatten more beasts; keep more milch-cows; *buy more food for them.*

Make, and take care of, more manure; enrich your farm; drain, or at least water-furrow, your fields; you will by these means get better crops and raise the value of your land.

Build no house, buy no piano, until you have all these things done and paid for, and have saved enough money to build the house and to lay out in luxuries.

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Lancaster, Ont., Jan. 2

At 12.34 P. M., t

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When you shall have carried out all the improvements I have pointed out to you, you will be surprised at the profits you will derive from your crops, at the independence it will afford you, at the consideration you will enjoy among your neighbours, and at the unbounded pleasure you will derive from the visits of your friends.

(Signed,) D. M. MACPHERSON.

Lancaster, Ont., Jan. 26th, 1892.

At 12.34 P. M., the session was adjourned to 2 o'clock.

At the renewal of the session, Mr. Barnard continued his lecture, and followed it by comments, which we regret not to be able to give *in extenso*, the stenographer, owing to a lamentable misunderstanding, not having taken them down; so we are obliged to give a condensed report from *Le Journal d'Agriculture*.

*Mr. Barnard* laid before us the progress that had been made since that far distant day, on which he, aided by some energetic farmers, laid the foundations of the dairy-industry in the province of Quebec. "Twenty years ago, when I asserted, at a meeting of farmers, that it was possible to make a net yearly profit of \$25 a cow, and even of from \$40 to \$50, by making cheese, my hearers could not help smiling, so exaggerated did these figures appear to them. Now that the dairy-industry has "given its proofs," I am here to tell you that even \$25 more than the highest of the above sums can be made by *winter-dairying*.

Any one can succeed in this, but on condition that he makes a large expenditure, in 1. intelligence; 2. in watchfulness; 3. in attention to details. The results to be obtained are: rich milk or plenty of meat. If we take as an instance the herd of cows at the Hospital of the Sacred Heart, at Quebec, we should find that each of the cows gives, on an average, 16 lbs of milk a day. One young cow, in particular, is now giving, 12½ month after calving, 20 lbs. a day, and that within a few weeks of her next calving. These cows receive food proportioned to their yield of milk. So, it is clear, that cows can be milked during 10 or 11 months of the year. If we want milk in winter, we must give *fresh grass* to our cows; that is, fodder that has been moistened and allowed to heat for 24 hours. Fodder that has been thus treated has a fine smell and is moist and succulent.

Mr. Barnard then spoke of the influence of the Woman in the household and in the work of the farm; without her powerful aid, the farm could not do much.

The speaker recalled some notable points of his visit to Vermont, U. S. He spoke again on the necessity of moistening dry fodder 24 hours before

giving it to the cows, and thus concisely treated this important point: dry fodder—empty udder: moistened fodder—full udder. Ensilage is the best way of economically preserving fodder, clover, maize, and 100 lbs of straw is worth 50 lbs of hay. A mixture of half straw and half clover is good. Cattle must have *complete rations*, sufficient in quantity to make them produce what is desired, but there must be no waste. As an example of a complete ration, take a mixture of clover and potatoes, or of maize (*green?*) and grain or cake.

The best milking races must be selected for the dairy, and bought cheap. According to Mr. MacPherson, the best milking race is the Canadian. Among the precautions to be observed, plenty of light in the cow-house is one; another is great cleanliness; another ventilation; and above all, we must observe the greatest regularity in feeding and milking; the manure must be taken care of, and lastly, we must never lose sight of the economical aim we have in view.

#### DISCUSSION ON MR. BARNARD'S LECTURE.

*A Delegate.*—I should like, Mr. President, to ask the lecturer a few questions. He advises us to use artificial manures. What artificials would answer best on our sandy lands in the *Ile aux Grues*?

*Mr. Barnard.*—This a difficult question for me to answer, as I am not acquainted with your soil. I have been told that, on the *Ile aux Grues*, potatoes grow well, and are your most productive crop. If this is the case, add to 20 loads of dung 4 or 5 cwt. of superphosphate, that costing \$25.00 a ton delivered. Keep your dung under cover, so that it may not be leached, and with half a dressing of dung and this addition of artificials, which will cost you from \$5 to \$6.25, you will find your potato-crop doubled (1).

You have no clover, you say, because the sun scorches it; well, when you have sown oats after potatoes, sow more clover-seed than you generally do, sow 12 lbs. to the *arpent*: try it on one *arpent*. Then, with a heavy roller, after having properly harrowed in the oats, give the land a slight coat of dung, if only 7 or 8 loads, well spread, and put on as soon as the seed begins to come up. Let the wheels be made as broad as possible [*i. e. the tires*], and you find that they will not cut up the land. Roll once more, since your soil is light; roll twice, once before carting on the dung, and once after it is spread. By spreading 8 or 10 loads of dung to the *arpent*, and treating the land like this, you will cut 250 bundles of clover to the *arpent*, provided you do not let your cattle on to it the first year.

If you have a good deal of snow in your district, try to do something to retain the first fall, even if it gives you a little trouble. A few poles or

(1) The text says: "of that superphosphate called 'plain,' which costs \$25.00 a ton"; but there must be some mistake here, as "plain superphosphate" only costs about \$12.00 a ton. A. R. J. F.

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rails, thrown down here and there, will prevent the drifting of the snow, and, with the blessing of Providence, I will guarantee you from 200 to 250 bundles of clover to the arpent. The following year, try timothy-seed with it; you will see what dung and artificials combined will do as regards a crop of fodder, and you will say that I have given you good advice.

*A Delegate.*—What is your opinion of *melilot*?

*Mr. Barnard.*—I think it is better for bees than for cows.

*A Delegate.*—You speak of raw potatoes for cows. Are they better than mangels or swedes?

*Mr. Barnard.*—As a rule, 100 lbs. of potatoes are equal to 200 lbs. of mangels or 150 lbs. of swedes. They are easier to grow in dry seasons, and are less liable to be choked by weeds.

*A Delegate.*—What difference do you find between *chaffed* hay scalded with hot water or simply moistened with cold water?

*Mr. Barnard.*—The nutritive value does not differ much, but there is assuredly a great saving in the time of preparation. If, as M. Bourbeau said yesterday, you chaff the hay (they have tried it; it was unknown two years ago, there), it will take you two hours a week to chaff for 20 head; but it will take much less time to feed your stock; you will save much more time than two hours. It is an economical plan. The long fodder that has been moistened is damp and difficult to carry about; it is better chaffed. Taking ton per ton, and not reckoning the labour, there is not much difference in the nutritive value; still, what difference there is in favour of the chaffed hay.

*A Delegate.*—That is not exactly what I wanted to know. I probably did not express myself clearly. What difference do you find between hay chaffed and scalded, and hay chaffed and simply moistened with cold water?

*Mr. Barnard.*—Not much, if it ferments for 24 hours. The great advantage of using hot water is that it excites fermentation more quickly; but at the expiration of 24 hours, the moistened and covered hay takes on a certain degree of heat, and, I think, you will find it as digestible as if you had used hot water for moistening the hay. Still, the hot water system enables you to scald in the morning for evening's use, and even for noon, if you are pressed for time.

*The Delegate.*—Is it advisable to give only this fodder, or should dry fodder be given as well?

*Mr. Barnard.*—I have tried both plans. A little mixture is all right, now and then. You might give some dry fodder every other day, and that, I think, you will find enough. After all, it is not very important.

*The Rev. M. Beaudry.*—I by no means wish to obstruct the labours of the convention, but I cannot allow the assertion of the very learned lect-

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urer to pass without entering my protest against what he has said about the *melilot*. This plant has been very much calumniated, especially by those who have never given it a fair trial; you know there is nothing rougher in argument than an example, and I think the facts of the case are rather in that category. Now, if the lecturer should happen to traverse the neighborhood of St. Hyacinthe, I beg of him to visit the farms at Ste. Madeleine, La Présentation, Petit Rang and Point-du-jour, where he will find land on which the herds of cows have been doubled in number since *melilot* has been grown there. This plant grows to a great height, and bears a very fine, rich seed. Sheep fattened on pastures where the *melilot* grows, always produce mutton of the finest quality. Besides, I should like, on every account, to see a trial of it for milch-cows, and especially as a material for the silo. M. François Chapdelaine, who is decidedly the best farmer at La Présentation, praised it very highly to me. A farmer, who lives at the gore [*équerre*] of the little range of St. Hyacinthe, told me that, by sowing it, he had rid the land of couch-grass and goose-grass, which could not stand against it. This clover has very vigorous roots, which stand two years. You now see why I felt it a duty to defend this plant against the attacks directed against it.

*A Delegate.*—Is this *melilot* more profitable on heavy or on light land?

*M. Beaudry.*—On heavy land, I think, because it is difficult to get it to take on light land. I do not believe it is generally sown in the right way. Many, who have sown it, have failed: it never came up. Monsieur Sarrasin, a sound practical farmer, told me that he had succeeded with it by sowing on the *crust*, after the last fall of snow in spring, because the seed, making a small black speck on the snow, absorbs the heat and falls on the earth. If any one cares to make a trial of *melilot* on his farm, I will send him seed. If he will pay the postage, I will furnish him seed gratis. <sup>(1)</sup>

*M Bernatchez.*—Mr. Fisher is ready to present the report of the committee on the samples of silage, and he will offer some explanatory notes on the subject.

(1) *White melilot.*—*Melilotus alba*. A biennial plant; that is, it flowers the second year and then dies.—(Provancher, Flore Canadienne.)

The *melilot* being a biennial, like the common red-clover, may be sown with grain. We hope to be able, at the next meeting, to give the nutritive value of this plant. Its richness in protein, according to Isidore Pierre, is superior to lucerne; as regards its value as a food, that chemist assigns it a place alongside of the latter. E. C.

*Potentilla anserina*—goose-grass; a perennial, villous plant. In clay-soils, it becomes frequently an injurious weed. (Provancher, *ibid.*)

MR. FISHER

Mr. President, Ladies

It is now my appointed to examine In making this report a novelty in our Canada been in use for a few rapid progress in its

This system has but it has been reser progress, and this for scale in America, an growing the crop. T growing maize for th

We have here, g delighted to find an innovation. We ha even of weeds, which especially in winter. plant; but, I am told sufficiently to make the province, sample

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## MR. FISHER'S REPORT ON THE SILAGE SAMPLES.

Mr. President, Ladies and Gentlemen,

It is now my duty to present to you the report of the committee appointed to examine the samples of silage submitted to the convention. In making this report, I will say a few words on ensilage, which is almost a novelty in our Canadian agriculture. The very name *ensilage*, has only been in use for a few years, but, since its invention, we have made more rapid progress in its management than in any other branch of farming.

This system has been understood in Europe for many hundred years, but it has been reserved for our time and our continent to cause its rapid progress, and this for two reasons : first, because we carry it out on a large scale in America, and, secondly, because we have improved the way of growing the crop. These are the reasons why we have succeeded better in growing maize for the silo than any people have previously done.

We have here, gentlemen, two classes of samples of silage, and I am delighted to find among them a kind of silage which seems almost an innovation. We have here several lots of silage made out of hay or grass, even of weeds, which are very good, and will furnish capital food for stock, especially in winter. Preference is generally given to maize as a silage-plant; but, I am told, it is difficult to get maize in this district to mature sufficiently to make very good silage; and therefore I find, in this part of the province, samples of silage made out of other plants than maize.

I find, too, that the best sample of silage we have here to-day, the best and richest in nutriment for cattle, is one made of clover, timothy, and a mixture of other grasses.

If I had to pick out and to buy as food for my stock one of the different samples which are before you, I should prefer paying twice as much for the silage composed of clover, timothy, and other grasses, as for any of the others, and for this reason : in that sample there is a grass that was nearly mature when it was ensiled, and in that grass there is a greater abundance of nutritive matters. Moreover, this grass is well preserved; it is rich and very well fitted for the food of cattle.

Unfortunately, Mr. President, we find in the different samples of silage something rather different to that which is usually found there. Almost all the samples we have examined have a bad smell; a smell that reminds one of the smell of manure, and that ought not to exist in good silage. It is not the case in all, but in the greater part. In the samples to the president's right, there is not this smell; in that other one, it does not exist; but in the greater number of samples, there is that smell of manure, and it comes, I think, from the fact that the silage has begun to rot.

We have also found that there is too much water in several of the samples we have examined, and we think that water has been poured into the silage while filling it. I dare not say that water has been added after the silage was packed in the box. Still, it is probable that some of those who sent samples put water into the boxes with the samples, before sending them off, because we found some so wet that, when pressed, water dropped from them. In many cases, it seems to me that too much water has been poured in while the silo was filling; I do not say afterwards, but during the filling of the silo.

For, in fact, Gentlemen, it may be advisable, if the maize or the fodder be very forward, nearly ripe, and very dry, to put a little water into the silo while filling; still, the addition of water to the silage is a very unsafe proceeding.

I should very much prefer ensiling the maize or other green-crop without drying it at all, quite green, pretty well matured, though not dead ripe, and put it in without drying it. Putting in water, *a part de l'herbe*, while filling the silo, is a very dangerous thing to do. (1)

In the first rank, we have put the sample to the right, marked "I." We have put it in the first rank, but we find that it must have been *selected*. The person who sent that sample probably picked out stems rather than leaves. He made a great mistake, for, in silage, it is the leaves that contain the greatest amount of nourishment. There ought not to be nothing but leaves, because to be good, maize ought to be sufficiently mature to have ears as well as leaves. There should be ears on the plant; and in a plant in that stage of growth, the leaves contain more nutritious matter than the stalks contain.

In this sample, I believe thoroughly that the stalks have been carefully picked out and arranged in the box, because I observe that it contains more stalks than leaves. It is a great fault, because the leaves are the more nutritious, and make better silage.

In the next sample, marked "H," I find the silage to be well preserved, and fairly well cut up [*chaffed*]: the smell is sound. I fancy the crop was nearly, though not quite ripe, when ensiled. It has kept well, without a trace of rotteness. I also think that it was allowed to dry a little before ensilement; but of this I am not sure; still, I think so.

Now, I would recommend you not to dry fodder-crops at all in the field, I prefer putting them into the silo green, just as soon as they are cut down in the field, and especially when the crop is sufficiently mature to have ears containing well formed grains: you had better put it into the silo at once. But, if the crop be still young, with no ears formed, it ought to be allowed to dry a little in the field, after being cut, before ensilement; for, when in such a state, it holds too much moisture to keep well in the silo. It would contain too much acidity, and would turn sour, were it carried and ensiled as soon as cut.

(1) Does *à part de l'herbe* mean "except the moisture that exists in the plant?" *Trans.*

The third sample the smell is good, but found several lots of must have been out all the machinery, used The chaff-cutter, especially The sample in question

After these three out of maize. The only clover. It is kept so well as the matured as the grass is rather stronger, and

Allow me to say If you aim at making ought always to grow in your district, you such as clover, or hay or other stuff like that have no maize. I am degree of maturity before silage before you that maize-silage or any other

This one, too, no plants in it, grass and I rather think that the from the second crop the field after the first leads me to think. Still, it is a very good

After the hay has two tons, or two and vert the second crop such a case, if your next cut clover with the rest

The third sample ment. They look a good many weeds, clearly ripe: this silage ward, that has been that can be made of it

Here, we have a nutritious matter in it. T



The third sample of silage is that marked "B." It has kept pretty well, the smell is good, but it was cut too long by the chaff-cutter. We have found several lots cut too long. I think the chaff-cutter was in fault: it must have been out of order; not kept sharp enough. All the implements, all the machinery, used in making silage, must be kept in good order. The chaff-cutter, especially, should be kept sharp all the time it is in use. The sample in question, putting aside this defect, is good enough.

After these three first samples, come three more which are not made out of maize. The two, packed in boxes, are of grass. In one, there is only clover. It is very good, very rich in nutritive matters, but it has not kept so well as the other. I think the clover could not have been so matured as the grass of the other sample, and, on that account, the smell is rather stronger, and it was not so easy to get it to keep in the silo.

Allow me to say that, with maize, very good silage can always be made. If you aim at making the best possible silage, maize is the fodder you ought always to grow. But, if it is impossible to grow maize to perfection in your district, you can always make good silage with other materials, such as clover, or hay, the mixed grasses, vetches or tares, pease and oats, or other stuff like these. Good silage can always be made, even if you have no maize. I am told that it is difficult to bring maize to a sufficient degree of maturity here to make very good silage, but there is a sample of silage before you that in reality is worth more than all the samples of maize-silage or any other sort exhibited here.

This one, too, number 2, is very good. There are two sorts of fodder-plants in it, grass and maize. The maize has not kept so well as the grass. I rather think that the sample of grass-silage in Mr. Taché's hands, is made from the second crop of grass. I fancy that a second cut was taken from the field after the first-cut. I am not sure, but that is what the quality leads me to think. The owner is here, I believe, and he will tell us. Still, it is a very good exhibit and the arrangement is good.

After the hay has been made in summer, even if the crop has been two tons, or two and a half tons, it is always difficult, in autumn, to convert the second crop of clover, or of clover and timothy, into hay; but, in such a case, if your maize crop is not very large, you can mix your second cut clover with the maize, and thus make very good silage,

The third sample is made of common grasses; a very useful experiment. They look a good deal like wild grasses. Among it there are a good many weeds, and they were cut rather late, as some of the seed is clearly ripe: this silage was made too late; still, if one has a field too forward, that has been allowed to stand too long, ensilage is the best thing that can be made of it.

Here, we have a pretty good lot of fodder, with a good deal of nutritious matter in it. The cattle will, I think, eat it voraciously; but had it

been made into hay, it would have been hardly worth anything; as it is, it seems to be useful stuff. I do not say that it is exactly good silage; but instead of making hay of grass like this, it is a better plan to ensile it and employ it in that form.

*Mr. Barnard.*—You advise people to cut it earlier?

*Mr. Fisher.*—Decidedly; it ought to have been cut three weeks or a month earlier.

There are weeds in it whose seeds are ripe; these seeds were put into the silo, a thing that ought never to be done. Ripe seeds ought never to be put into the silo; but if one has a field where the seed has ripened like this, by ensiling the crop it can be better utilised than by harvesting it any other way.

There were 17 samples of silage submitted to us for judgement. They came from

- M. Pierre Lortie, Beauport;
- “ Hugh Brown, St. Joachim;
- “ D. C. Bourbeau, Victoriaville;
- “ D. Fortin, St. Joachim;
- “ J. F. Plamondon, Wotton;
- “ Isidore Lheureux, St. Joachim;
- “ Jean Chouinard, St. Jean Port Joli;
- “ E. Sabourin, M. D., Ripon;
- “ Cyr. Ouellet, Kamouraska;
- “ T. Brodeur, St. Hugues;
- “ Gab. Dubeault, St. Gabriel;
- “ Honoré Lortie, Séminaire de Québec;
- “ E. Picard, Wotton.

The six samples, classified in order of merit, belong respectively to

- M. J. E. Plamondon;
- “ E. Picard;
- “ Israël Belisle;
- “ P. Lortie;
- “ Honoré Lortie;
- “ Cyr. Ouellet.

We have classed these 6 samples as being the best. There are others that are good, and, we regret to say, others that are of inferior quality. I do not wish to discourage people, for I am sure that in these samples we have another proof that it is in our power, even easy, to make good silage here, without enjoying the advantage of being able to grow very fine

maize. I congratulate this place, who have

If any one will I will reply to the faults I commit in meeting in that la

DIS

*M. Bernatchez.* subject of his report

*A Farmer.*—C

*Mr Barnard.*— [yongs] are hollow, why they should not dry plants that green, and you are hollow. Mr. Fisher in the silage, because

*A Farmer.*—T

*Mr Barnard.*— then it will pack p

*The Farmer.*— sand-banks, and ha

*Mr Barnard.*— farmer. As Mr. Fisher be green. If you h

(1) This *foin de grève*. Many of them are perennial the fall. The distinction plants, should have been the composition of the *foin*

While awaiting an opportunity to showing its suitability *Flore Canadienne*, by M.

*Three-cornered rush*—the Lower St. Lawrence.

*Black-grass*—*Juncus* pretty good fodder.

*L'herbe à liens.*—Calan never cultivated, makes It is said to be almost as

(1) Lots of it cut for the out if allowed to ripen the pastures. A. R. J. F.

maize. I congratulate your county, Gentlemen, as well as the farmers of this place, who have so well succeeded in their attempts at making silage.

If any one wishes to ask me any questions on the system of ensilage, I will reply to the best of my ability. I trust I shall be pardoned for the faults I commit in French, as it is difficult for me to address a public meeting in that language.

#### DISCUSSION ON MR. FISHER'S REPORT.

*M. Bernatchez.*—Should any one wish to question Mr. Fisher on the subject of his report, he will be happy to give any explanations.

*A Farmer.*—Can long-shore-hay (*foin de grève*) be used for ensilage?

*Mr Barnard.*—I believe I can answer that question. If your rushes [*joncs*] are hollow, do not ensile them; if they are not so, there is no reason why they should not be ensiled, if you take Mr. Fisher's advice and do not dry plants that are already hard and full of seed. Cut your fields very green, and you will make capital silage. If they are too forward, too hollow, Mr. Fisher is perfectly right; there must be no injurious seed in the silage, because that makes it more likely to go bad.

*A Farmer.*—This sort of fodder is always soft.

*Mr Barnard.*—The danger is that it be too coarse. Cut it green, and then it will pack perfectly in the silo.

*The Farmer.*—The danger is that in cutting it green, we may ruin our sand-banks, and have no crop the following year. <sup>(1)</sup>

*Mr Barnard.*—Try it on a small scale. The silo is the fortune of the farmer. As Mr. Fisher says, ensile any fodder-plant you like, provided it be green. If you have not enough of one crop to fill the silo, put in 5 or 6

(1) This *foin de grève* is a mixture of several species of plants belonging to different families. Many of them are perennial, that is, new stalks spring from the roots every year and die down in the fall. The distinction which seems to have been aimed at here between annual and perennial plants, should have been preceded by a determination of the varieties of plants that enter into the composition of the *foin de grève* of which the meeting was talking.

While awaiting an opportunity of informing our readers as to the average composition of the Canadian *foin de grève*, on which subject we should like to see a special essay made with a view to showing its suitability for ensilage, we offer them the following passages extracted from the *Flore Canadienne*, by M. l'Abbé Provancher. E. C.

*Three-cornered rush*—*Scirpus triquetus*—forms a considerable proportion of the *foin de grève* of the Lower St. Lawrence.

*Black-grass*—*Juncus bulbosus*—a perennial rush, a plant growing on the salt-marshes—makes pretty good fodder.

*L'herbe à liens*.—*Calamagrostis Canadensis*; Blue-joint grass; a perennial grass, which, though never cultivated, makes capital fodder, much liked by cattle when green, or even as hay in winter. It is said to be almost as nutritious as timothy. (1)

(1) Lots of it cut for the paper-mill at Sorel when it was running. Many perennial grasses die out if allowed to ripen their seed. Hence the many failures in attempts to lay down permanent pastures. A. R. J. F.

feet deep of it and tread it well down. Put some sort of cover on it, even if it be only paper, and when you have another crop, put 8 feet more on the top ; and 6 weeks or so afterwards, put in 8 feet more, taking care to tramp and cover it each time. You will then have a sample of three or four different fodder-crops, and the next year you will have found out which is the best.

*M. Fournier.*—The trouble is, that to preserve our long-shore-hay, we are obliged to cut it late.

*M. Bernatchez.*—A friend of mine, an old medical man, very learned, told me once that many of these plants are annuals, which seed down every year, and the proof of the truth of this is that they die out if they are cut before the seed is ripe. He was speaking of what is called *herbe à liens*. I can only speak of this from what I have heard from one of my best friends, and I advise you to be careful. Try a small ensilement of these plants, and do as Mr. Fisher recommends ; cut as green as possible, and ensile them as quickly as you can. When a certain degree of fermentation has supervened, tramp the silage and put on a fresh layer.

*Mr. Fisher.*—There is much juice in the plant if cut very green. I would let it dry a little in the field before ensiling it. Whether there be a great deal of juice in the plant, or whether you put water to it in the silo, comes to pretty nearly the same thing. Putting in water is the worse plan, but it is bad enough to have too much juice in the plant to be ensiled.

*Mr. Barnard.*—M. Fournier is troubled ; because they cannot cut the plant before it is nearly ripe.

*Mr. Fisher.*—If the plant be nearly ripe before cutting, ensile it at once without drying it. When filling the silo, the silage should always be allowed to heat up to 125° F. or 130° F. By allowing it to heat up to that point, the silage will be always sweet ; otherwise it will be too sour.

*Mr. Barnard.*—If you have no thermometer, you can adjust the heat thus ; when you can hardly bear your hand in the silage, the heat will be between 125° and 130°.

*M. Bernatchez.*—Here is a sample ; it is dry ; the plant is said to be a perennial. It is certain that if it be cut too early, it will rot.

*Mr. Fisher.*—If cut very green, the rain will get into the hollow stalks and cause it to rot ; but after it has hardened a little, the rain will not penetrate. However, I think such a plant as this propagates itself by its roots, even if the seed do not sow itself when ripe enough to fall out of the capsules.

*M. Lachaine.*—I do not see why the plant should bear seed if it is of no use. If it is cut early, it grows again, does not rot, and becomes as high as it was originally. It grows all the season, if it does not ripen its seed.

*Mr. Fisher.*—And the following summer it does not grow at all ?

*M. Lachaine.*—seeds. I do not see

*Mr. Fisher.*—S by seeds (1).

*M. Lachaine.*—grows if the land s seed will not take sand-banks and dar

*Mr. Barnard.*—this plant before th

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*Mr. Fisher.*—I silo. It is true tha climate is less sev England, while, he for pressing the sila are very dear. He tackle to press the s cost much more to would be much less obliged to house all the whole winter i the stacks, which w

(1) Especially, couch-grass.

(2) "Foin en meules".

(3) In South-Wales, ca they are taken in about th cows are stabled at night

*M. Lachaine.*—It grows, but very sparsely. Each sprout bears several seeds. I do not see why the seeds should be there, if they are useless.

*Mr. Fisher.*—Several plants reproduce themselves both by roots and by seeds (1).

*M. Lachaine.*—True enough, this plant grows in the same way. It grows if the land suits it. On our sand-banks, we have natural grass; the seed will not take in dry soils; it will grow where there is water; on sand-banks and damp places.

*Mr. Barnard.*—Would you not recommend people, Mr. Fisher, to ensile this plant before the seed reaches maturity?

*Mr. Fisher.*—Decidedly.

*A Farmer.*—What are we to do when the silage does not heat enough at the proper time?

*Mr. Fisher.*—It is almost necessary to cover it.

*Mr. Barnard.*—And then it has a bad smell. The less it heats, the stronger is the bad smell.

*A Farmer.*—What should be done if it does not heat enough?

*Mr. Barnard.*—If no bad smell arises from it, there is no danger; but that is very rare.

*A Farmer.*—May water be added to make it ferment?

*Mr. Fisher.*—No. If it was very dry when cut, the addition of water might be permitted, but it is always dangerous. By adding water, you will almost always produce a bad smell. I would rather leave the silage a little acid.

*A Farmer.*—I see in the papers, that in England they put the hay in stack and cover it as for a silo. They say that it keeps just as well (2).

*Mr. Fisher.*—I am asked if, in England, silage is not made without a silo. It is true that, there, silage is made in stacks, but that is because the climate is less severe than here. Besides, all buildings are costly in England, while, here, a silo does not cost much. In England, the tackle for pressing the silage in stacks, the wire, ropes, &c., are cheap; here, they are very dear. Here, a good silo, can be built for little; in England, the tackle to press the silage-stacks can be had cheap; in England, it would cost much more to build a silo than to buy the tackle. In our winters, it would be much less handy to have the silage out of doors, since we are obliged to house all our cattle at that season; in England, cattle pass almost the whole winter in the open air, so they get their feed of silage close by the stacks, which would not be easily done here (3).

(1) Especially, couch-grass. A. R. J. F.

(2) "Foin en meules" should mean the grass which would otherwise be made into hay. A. R. J. F.

(3) In South-Wales, cattle are out all the year. In the S.-E. of England and all along the coast, they are taken in about the end of January, to allow the pastures to get a chance to grow; but cows are stabled at night from November 1st. to May 1st. A. R. J. F.

*M. Caron.*—As regards Timothy for the silo, how nearly ripe should it be ?

*Mr. Fisher.*—Rather riper than if intended for hay. I always cut my grass for hay very green ; the clover is cut when in early flower. For silage, I prefer waiting till the flower is nearly black. The reason is, that in making hay you dry the plants ; but if you ensile a plant that is already a little hard, it will not get any harder ; on the contrary, it will become more tender. Clover and timothy, for silage, should be cut a little riper than for hay.

*Mr. Barnard.*—I may be permitted to remark that, here, hay is unfortunately allowed to become dead-ripe before cutting.

*Mr. Fisher.* I never cut mine too ripe. For silage, I cut clover when the head is a little black, when the bloom is a little withered. Timothy, I cut when the blossom has fallen, before the seed is too forward. For hay, I cut timothy before the blossom falls, and clover, when the flowers are all out, all red.

*Mr. Barnard.*—I understand, Mr. President, that you have a lecture to give us on the beet-sugar manufacture ; I should be very glad to hear it.

*M. Bernatchez.*—It is not a lecture ; it is only a *causerie*.

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## M. BERNATCHEZ LECTURE.

### THE SUGAR-BEET INDUSTRY.

*Gentlemen,*

I do not intend to address you at great length, but I have been asked to say a few words to you on an industry that I think is destined to produce most advantageous results to the province of Quebec : I am about to speak of the, beet-sugar industry. As many of you know, I, not very long ago, travelled through parts of Europe, with a view to the study of some of the questions that concern that important business. I will try to give you, in a few words, the results of the observations I made during my tour on the continent.

Growing sugar-beets is quite a new pursuit in this country. It was only begun a few years ago, and though, up to the present, the results have not been very favourable, I believe that, when the process is better understood, it will become a considerable source of profit to our farmers. There are now in this province two beet-sugar factories : one at Farnham, the other at Berthier.

In order to make beet-sugar, it was first necessary to set about producing the raw material : people had to learn how to grow the beets.

Experiments were made in sundry instances. It is not far to seek for methods of making Very skilful men can teach lessons to our farmers the principles of the were strangers to the soil nor with our system all the precautions much in a hurry ; for outlay was made the buildings finished, as to this crop ; you get much money for the The affair was started suitable to the country they did not cultivate ago, when I was a minister taken to induce us to nothing about it ; but and after hearing of who assured us that that the cultivation of House, fresh demands prayed to make a sugar-beets.

The Government commission should be was carried unanimously honor to be appointed sugar factories, but information possible on and the cultivation of before the beets were formation we obtained results ; but, on the whole, surmounted. Like the trouble, and in the commencement, there had asserted there, as the of cropping, without ful. Many were the owner of a large factory that he could not get every possible encouragement

Experiments were made; they were successful here, there they failed. If, in sundry instances, success did not equal expectation, I think the reason is not far to seek. The crop was quite new to the country, and the methods of making a profitable use of it were not sufficiently understood. Very skilful men came hither, with the special mission of giving practical lessons to our farmers in the best mode of growing sugar-beets. As far as the principles of the task went, they acquitted themselves well; but they were strangers to the country, and they were familiar neither with our soil nor with our system of farming. They did not show us how to take all the precautions necessary to ensure success. Things were done too much in a hurry; factories were erected at a great expense, and large outlay was made to prepare for the campaign. The spring saw the buildings finished, and the proprietors exclaimed: "Your land is suited to this crop; you will grow so many tons of beets, and you will get so much money for them. The crop, you will soon find, is a profitable crop." The affair was started, just as if it was some business already proved suitable to the country. Many people, unfortunately, lost largely, because they did not cultivate the crop properly. Last year, two, even three years ago, when I was a member of the Committee on Agriculture, steps were taken to induce us to recommend the pursuit of this industry. We knew nothing about it; but, after reading the reports which were furnished us, and after hearing of the experience of some who had grown beets, and who assured us that the crop was a paying crop, we expressed a desire that the cultivation of the beet should be encouraged, and, last year, in the House, fresh demands were brought forward, and the government was prayed to make a grant for the purpose of promoting the growing of sugar-beets.

The Government, as you are aware, hesitated, and proposed that a commission should be sent to study this question in Europe. The motion was carried unanimously in the Legislative Assembly, and I had the honor to be appointed one of the commission. We not only visited the sugar factories, but we also examined the beet-crops. We got all the information possible on the spot. We observed the preparation of the land, and the cultivation of the plant; the harvest we did not see, for we left before the beets were ripe. We visited many of the factories. The information we obtained was encouraging, and showed most advantageous results; but, on the continent, as it was here, many difficulties had to be surmounted. Like every other new speculation, the starting point was the trouble, and in every place we visited, they told us that, at the commencement, there had been many impediments to overcome. The farmers asserted there, as they do here, that it was unwise to start a new system of cropping, without knowing whether it would or would not be successful. Many were the failures, especially in Italy, in which country the owner of a large factory told us that, after three years' experience, finding that he could not get a sufficient quantity of beets, although he offered every possible encouragement to the farmers, he was obliged to set to work

to grow them himself. He had about 90 acres of land; these he manured and sowed with beets, and very well the crop turned out. Still, this was not enough to supply his factory; yet, his success on his own land at last triumphed over the obstinacy of his neighbors, one of whom, the possessor of a large estate, whose acquaintance I had the pleasure of making, grew, last season, 960 acres of beets. With the assistance of some other land-owners of the neighbourhood, our manufacturer managed to get enough to keep his works going, and he will soon be obliged to increase the capacity of his factory.

In France and Belgium, as well as in Italy, farmers are perfectly satisfied with the crop. In France, farmers told me that at first it was with the greatest difficulty they were persuaded that growing beets would pay. In France, it is the same as in this country; cattle are fed in the stalls all the year round; there are exceptions, but, in general, the system of in-door-feeding is practised. As Mr. Barnard said just now; in that country, he who has 200 acres is a great landed proprietor. Small properties are the rule, and their owners devote themselves to their usual garden-cultivation; they could not believe that beets would pay. At last, they tried it, and found that the exhausted pulp was a very rich food, giving plenty of milk, and very useful in fattening cattle. Thus they came to the conclusion that the cultivation of beets would give them more cattle-food, enable them to increase the number of their herd, and thus lead to an increased production of manure. Manure is dear in France; a great deal is wanted, since all the land is under the plough. There are hardly any pastures there as there are here, it is all in crop. Much manure is needed for land under such a system of farming, artificials are very dear; so by means of the beet-crop, farmers have been able to increase the amount of dung at their disposal, and thus to enrich their land more than ever.

To show you how people, in some places, follow old-fashions, I will give you an instance: In the residue of the process of the sugar-making, a good deal of earth adhering to the beets is to be found, and this, with the remains of the lime employed in the factory, makes a very rich manure. At first, it was offered for nothing to the farmers; they would not look at it; they would not cart it away. It is no longer thus; they buy it and cart it home as soon as there is any, in fact, they compete for it.

And so it is with the pulp. Farmers used to say it was not worth cartage. Now that they know its value as cattle-food, they are quite satisfied at paying from \$1.00 to \$1.50 a ton for it.

Now, you will perhaps say: If this pays them, it is because labour is cheaper there, and they have advantages that we do not possess. True, labour is cheaper there than here, but I think we have in our favour several elements of compensation. For, if labour is dearer here, land, here, is much cheaper, and, besides, we are not laden with such a heavy property-tax. Again, vegetation is much more rapid with us; consequently

hoeing costs less. slow. In Italy, there, in the first which were only the first hoeing. taking possession of sary, whereas, with be wanted. Beets the plants are up in to single, and the the land, and it was people here hoe two even three hoeings

Again, manure "pull" in our favor

In short, I think the beets, delivered abroad.

How much do is paid here; 22 to factories where the 23 francs; that is added to the premium beets delivered at the

There are certainly the beet, being a heavy crop, the succeeding of hay afterwards.

To conclude the farmers to begin it an arpent or one ar they will assuredly

You will ask, to be prepared? Alluvial and clay lands soils and clay-loams

The preparation growing the greatest the fall-sowings are pre-winter ploughing up of the land is of land, after this operation frosts and that



hoeing costs less. Abroad, they sow very early, and vegetation is very slow. In Italy, they sow towards the end of February, and when I was there, in the first week in May, they were only just singling the beets, which were only from an inch to an inch and a-half in length: this was the first hoeing. During this great length of time, the weeds had been taking possession of the land, which rendered two or three hoeings necessary, whereas, with us, in my opinion, only one hoeing would, in general, be wanted. Beets are like other roots; if the land be warm at seed-time, the plants are up in a fortnight, and a fortnight after that they are ready to single, and the weeds have not had time to oppress them. You clean the land, and it wants no more hoeing; all is done at one hoeing. Some people here hoe twice; but, as a rule, once is enough, while abroad, two and even three hoeings are always needed. This adds to the cost of labour.

Again, manures are more costly in Europe than in Canada: another "pull" in our favour.

In short, I think we may conclude, that while our labour is dearer, the beets, delivered at the factory, do not cost the farmers here more than abroad.

How much do they pay for beets? you will ask: about the same as is paid here; 22 to 25 francs, \$4.40 to \$5.00 a ton; but I only found two factories where they were paying 25 francs; the others pay 22, 22½ and 23 francs; that is about the general price. Here, we get \$4.50, which, added to the premium of 50 cents allowed by government for each ton of beets delivered at the factory, makes the price \$5.00 a ton.

There are certain advantages common to both countries: one is, that the beet, being a hoed-crop, very much improves the land. After a hoed-crop, the succeeding grain is sure to be abundant, and there will be plenty of hay afterwards.

To conclude the subject of beet-growing, I am not prepared to advise farmers to begin it on a large scale. Let each first make a trial with half an arpent or one arpent; and when they have proved that the crop pays, they will assuredly increase the quantity.

You will ask, perhaps, what soil suits beets best? How is the land to be prepared? Abroad, most of the land is calcareous, but there is also alluvial and clay land, like our own. I was told that, in general, alluvial soils and clay-loams were the best suited to this root.

The preparation of the land is conducted thus: farmers that aim at growing the greatest crops, usually plough the land intended for beets after the fall-sowings are done. Very frequently they take advantage of the pre-winter ploughing to use the sub-soil plough. This additional breaking up of the land is of great benefit to the development of the roots. The land, after this operation, lies untouched all the winter. When the alternate frosts and thaws have pulverised the soil, it is harrowed and ploughed

again. The manure is then ploughed down. On some farms, even a fourth furrow is given. Beets demand a soil well manured, deep, and very thoroughly pulverised, or else it cannot send down its roots with freedom. I am told that the part of the beet above ground is not so rich in sugar, has not so great a percentage of sugar, as the part underground; it is therefore a great advantage that the root should penetrate as deeply as possible. The longer it is, the greater the yield, and, consequently, the more deeply the soil is pulverised and manured, the greater the chances of success. On the contrary, if the plant meets with a hard sub-soil, it cannot get through it, it spreads itself on the surface, and that prevents it from acquiring a proper proportion of the sugar it would otherwise assimilate.

It is also said, that it is better to manure the previous crop to the beet. Fresh dung is not good for this root; it is more favourable to the production of weeds.

In my opinion, the beet-crop will succeed very well, not only in the district of Montreal, but also in the Quebec country. Our season may be shorter, but vegetation is more rapid, and we have plenty of alluvial soil very susceptible of improvement.

Frosts are mentioned as opposed to success in this project; but, from recent experience, it is acknowledged that frost is no hinderance, if the thawing out of the frozen roots can be avoided. It is not so in Europe; there, frost is a great drawback, because if the beets get frozen, it is almost impossible to prevent their thawing: they cannot be kept in a frozen state, and the thawing ruins them. But here, according to the year's experience at Farnham, they succeed very well. When beets are frozen, although they are not so easily manipulated, they contain as much, if not more sugar, than when they are not frozen.

If there is any great difference in favour of Europe, it is in the carting to the factory. There, the cartage is no great trouble; for the roads are splendid, all being macadamised. The beets are carried in great wagons, drawn by 5 or 6 horses, and carrying enormous loads of roots. Here, we cannot do this; we must draw light loads, because our roads are very bad, and are in the worst condition just at the time when the beet-harvest is being carried on—unless, as M. Musy told me, when I was at Farnham, it were possible to arrange that beets be not sent to the factory except in a frozen state, in winter, which would answer just as well, and they would give as good and as abundant a yield of sugar as if they were sent in a perfectly fresh state. This has answered well in Russia, and as you will see, it ought to answer equally well here.

It now remains for us to consider if it would be beneficial to our province to grow this crop here. Every thing that pays is beneficial. Instead of growing as much grain as we do, if we were to put part of the labour into an *arpent* or half an *arpent* of beets, we could sell the produce

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for \$5.00 a ton. The average yield is 15 tons an *arpent*. At Berthier, at St. Cuthbert, and in another parish, the name of which escapes me, 25 tons an *arpent* have been grown. This year, the farmers are very well satisfied with the crop. The results are encouraging, and next year a larger superficies will be sown. This is very wise, for then the Berthier factory will be at work; so we shall have two active factories in the province.

I lately saw, in the papers, that Baron de Seillièrè, who owns this factory, intends to start one in the Quebec district; if so, I think it will benefit all of us. With such little trials as we can make, we shall easily see if it pays or not. Should it turn out profitable, every one will go into it, and will have the advantage of carting home the pulp for the stock. This pulp keeps well; I have seen some three years old that was quite sound. It is capital food; it fattens cattle and produces plenty of milk.

We have, therefore, every reason to look for success in this project and for this crop.

And I need not tell you that this crop pays the manufacturer, for, did it not pay, the factories could not stand. People say sugar is too cheap, the factories make no profit. Well, in France, there is a tax of 60%! When all the juice from the beets is in a state of syrup, the officers test its richness, and upon that make the charge for duty. Sugar is sold, wholesale, at 3 to 3½ sous a pound only, and in spite of the price, the business pays as well as anything in France. For export, 3 to 3½ sous is the price; it is true that for local consumption the price is higher, for duties on the sugar are only payable on that part which is consumed in the country; that sold for export is duty-free. Here, the manufacturers have no duty to pay; on the contrary, the Government gives them a premium. There is no doubt that at 4 cents a pound, both manufacturer and farmer will find the business profitable.

I was speaking just now—pray forgive me if I say in a desultory manner every thing that comes into my head—I was talking about labour. I told you that in Italy labour was very cheap. I have seen there men and women working from morning till night at 20 *sous* for the men, and for the women 10 *sous*. In France and Belgium, in general, labour is about 60 to 80 cents a day. Rather less than we pay here, but in some places there is but little difference.

Large crops are grown; you may see immense fields of beets, but they have more time at their disposal than we have. That would be the difficulty here; if we tried to grow a great extent of crop with only a few hands. But if every farmer were to grow an *arpent* or two, as he could find hands to cultivate them, I believe it would soon pay them.

If it is not desired to change the beet-land every year, it is possible, if we are pressed, to grow beets several years in succession on the same piece. When land is once thoroughly put in order, it is easy enough to

work the following year. I have seen this done at St. Barthélemi, where beets were grown seven years running on the same land with perfect success. It is true that this wears out the land, but as regards the yield, with plenty of manure, good results are obtained. Fifteen tons at \$5.00—75.00, cash, too, the arpent. You may now and then make as much with some other crop, but you will have to wait for your money; whereas this is “cash on delivery.”

No doubt this industry, like every novelty, will be criticised; still, as a matter of public benefit, I think it will be very useful. We import millions of dollars' worth of sugar every year. If we could produce it at home, this money would remain in the country, and the business would give a good deal of employment in the province. It often happens that many people leave us because they cannot get year-long work. When an industry like this is established, which will require labourers all the year round, they will stay at home instead of emigrating. If the factories give employment in winter, our people will stay here through the summer and work in the beet-fields. There are factories that employ from 130 to 150 men making sugar during 4 or 5 months of the winter season.

Besides these, there are the refineries, which employ many hands. These works are generally separate establishments, but some of them belong to the same firms as the factories; however, that is not commonly the case, for the manufacturers prefer selling sugar raw to refining it; it is an entirely different business, is the refining, and there are additional imports levied on the product, so that the trade is in other hands. In the refineries, the work is very interesting; it is generally done by women, who put the sugar into the pans by small portions at a time, (*mettant le sucre par petits morceaux.*) Their fingers are more supple, and they work for less money than men. They work very quickly.

And so, Gentlemen, I have given you a sketch of this industry, and of the profits to be derived therefrom. I frankly say that I think we can make it answer here; perhaps not every year; nobody is always successful; one year in ten there may be a failure, but, on the whole, I believe we shall succeed.

The *white* sugar-beet is the kind for our alluvial and clay soils; grown on such land, it is richer in sugar than other kinds. It does not become large, but large beets are not the best suited to make sugar, and the manufacturers understand the difference and pay accordingly; so there is no use trying to grow big roots: at the factory, they only pay in proportion to the sugar in the beets. It is therefore better to grow beets that hold a good deal of sugar in a small bulk. The white beet is not very large, about ten inches long generally. It is quick work pulling them at harvest. There are implements that under-cut the roots and raise them to the surface. All that has to be done is to gather them together and top them; that is soon done. I saw some got up this way last autumn.

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I know I have detained you a long time, but I have nearly done, only I wish to say a few words about the difference between the mode of living among the French peasants and the mode in which our *habitans* live. A journey abroad makes one love one's own country. Europe is, in truth, a splendid sight: there are many conveniences, many advantages in the mode in which some people live there, but, for the greater number, life is not free from misery. I told you that, in Italy, women work for 10 *sous* a day and find their own food! (1) Men, at 20 *sous* a day, hoe from 5 A.M. to 7 P.M. under the eye of a man who is constantly behind them; they dare not raise their heads too often; and all for from 10 to 20 *sous*! Not very pleasant to live in this way, is it? In France, although the farmers make money (their farms are cultivated to perfection, like a garden, every corner is kept in full production), their houses are not nearly as comfortable as are the general run of our *habitans'* houses; they are neither so comfortable nor so roomy. The houses are generally low, they have very few windows; the floors are never of wood, but of burnt earth, stone, or pebbles; consequently, they are always damp. In some houses, belonging to people in easy circumstances, you find no comfortable arrangements, and they are very damp. They are far from being as pleasant as our own houses. Many of our people complain of hardships, but were they to fall suddenly into the position in which those of whom I am speaking live, they would say: we were far better off in Canada. They are generally very economical; they are possibly crushed by the weight of taxation; at any rate there is nothing approaching to luxury in the abodes of these farmers, though they are satisfied with their position and are not ashamed of it. It does not shock them to go to market or even to visit their friends *in carts*. I saw two *Merciers*, descendants of the same family as our ex-premier, who came from the next commune (parishes, in France, are called *communes*) to pay him an unceremonious visit one fine Sunday. They wore blue smock- frocks, (*blouses*) all of the same size and shape, down to the knees. They were people who could afford to dress well, they were well off; but they came in this costume and were not ashamed of it. At the fairs and markets the French farmers all dress like this, and they carry their heads as high as any one. This shows that they practise economy, and are not ashamed of their position.

There was one thing that pained me much there: they did not seem to have the same respect for women that we have. Women work very hard there; you see them constantly in the fields, even working on the land. The root-crop is often hoed by women. I have even seen them ploughing, harrowing, mowing, and mowing with the large scythe, too. Scythes are still in use in France, they still use the scythes that we call here "German scythes," (2) with blades broad at the heel, straight helms,

(1) Maccaroni, and *polenta* made from chestnut-meal, are very cheap in Italy. A. R. J. F.

(2) Is this what is called in Europe the "Hainault scythe," that poor Philip Pusey tried to introduce into England just before Hussey, and his rival, McCormick, sent the first reapers to that country? A. R. J. F.

and only one handle. The large landed proprietors have plenty of agricultural implements, but the land, generally, is divided into such small farms, that they would not pay for such expensive tools, so the men have to do all the work by hand, as we used to do here.

I hope, Gentlemen, you will excuse the very desultory way in which I have presented these notes. I have been speaking from memory, I have plenty of things I should like to say, and which might interest you, but time fails me. Thank you very much for your attention; I hope all I have said has been taken in good part; I was about to say that I hope I shall not be too severely criticised, as has happened to me more than once. If my language is not strictly grammatical, that is not my fault. If my education was neglected, it was God,—at any rate it was my father—who did not desire that it should be attended to. Thank you, Gentlemen. (Applause.)

Before resuming my seat, I wish to supply an omission I made. During my tour, I heard many a time the regretted Mgr. Labelle spoken of with great and merited praise. We all know how deeply he was interested in agriculture and the dairy-industry, and we had the honour, last year at the Sorel meeting, to listen to his eloquent address and his so judicious opinions. I hope that, before leaving, the Board of directors will pass resolutions of condolence at his premature death.

You are aware that this association publishes yearly a report of all that has been said and discussed at each convention. Lectures, too, are published in the report that, for want of time, have not been delivered during the meetings. As these details were not until now commonly known, I trust that many of my fellow-citizens both of Montmagny and of the county, will subscribe to the Dairymen's Association, for each subscriber has a right to a copy of the report, which forms a pretty large book, and is always full of information. There are still further advantages; one of which is, that any member who wishes to visit our convention can get a railroad ticket at half-price. Besides, the report alone is well worth a dollar, the price of subscription, and it is a means of encouraging agriculture and especially our association, which is kept up by a small grant from government, but chiefly by the subscriptions of the members. There are already a good number of members; more than 400; and I am sure that, in this county, a fair number of farmers will be found to give their aid freely in encouraging the work of the association.

The session of the convention was then adjourned to 8 P.M.

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The elections

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#### DISTRICTS.

Arthabaska .....  
 Beauce .....  
 Beauharnois .....  
 Bedford .....  
 Charlevoix .....  
 Chicoutimi and Saguen  
 Iberville .....  
 Joliette .....  
 Kamouraska .....  
 Montmagny .....  
 Montreal .....  
 Quebec .....  
 Richelieu .....  
 Rimouski .....  
 St. Francois .....  
 St. Hyacinthe .....  
 Terrebonne .....  
 Three Rivers .....

Session of January 28th, at 8 P.M.

The President, in taking the chair, summoned the convention to proceed to the election of officers. The re-election of M. N. Bernatchez, outgoing president, was proposed by M. T. C. Cartier, seconded by Dr. A. Bruneau, and carried unanimously; but M. Bernatchez declined the nomination, saying that he was glad to have been president of the Dairymen's Association for two years. In accepting that office, his sole desire was to attract the meeting of the association to Montmagny, and having, happily, succeeded in this, and having done his part as president, he wished to see the honour conferred on somebody else.

The Rev. M. l'abbé Montminy, Curé of St. Georges de Beauce, was then elected president by acclamation. On taking the chair, in the midst of enthusiastic cheers, M. Montminy thanked the meeting. As a priest, he thought he perceived, in his nomination as president, a mark of the esteem and respect that the members of the Dairymen's Association felt for the Canadian clergy.

The elections then took place with the following results:

#### OFFICERS.

Honorary President.—Honorable P. Boucher de LaBruère.

Honorary Vice-President.—M. Naz. Bernatchez.

Acting President.—M. l'Abbe T. Montminy.

Vice-President.—M. S. A. Fisher.

Secretary-Treasurer.—M. J. de L. Taché.

DISTRICTS.	DIRECTORS.	RESIDENCE.
Arthabaska.....	T. C. CARTIER.....	Kingsey, French-Village.
Beauce.....	PHILIAS VEILLEUX.....	St. François, Beauce.
Beauharnois.....	D. M. MACPHERSON.....	Lancaster, Ont.
Bedford.....	J. A. HAYES.....	Sheffington.
Charlevoix.....	CHAS. MARTEL.....	La Baie St. Paul.
Chicoutimi and Saguenay...	F. PARADIS.....	Bagotville.
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 CHICHOINE.....	St. Marc.
Quebec.....	L. P. BERNARD.....	Cap Santé.
Richelieu.....	DR. A. BRUNEAU.....	Sorel.
Rimouski.....	A. A. NICOLE.....	St. Simon.
St. François.....	D. O. BOURBEAU.....	Victoriaville.
St. Hyacinthe.....	L. T. BRODEUR.....	St. Hugues.
Terrebonne.....	FRS. DION.....	Ste. Thérèse
Three Rivers.....	L'ABBÉ D. GÉRIN.....	St. Justin.

REPORT OF M. SAUL COTE, INSPECTOR-GENERAL OF  
SYNDICATES.

TO THE MEMBERS OF THE BOARD OF DIRECTORS OF THE DAIRYMEN'S  
ASSOCIATION OF THE PROVINCE OF QUEBEC

Gentlemen,

As Inspector-General of the syndicates of creameries and cheese-factories of the province, I have the honour to submit to you my annual report. I was in hopes it would be more complete, and, therefore, more interesting, but I deceived myself, since the inspectors of syndicates have not all returned a detailed report of their operations this year. In saying this, I do not impute blame to any one, but I simply state the existence of an omission which might easily be supplied, by giving complete formulæ of their reports to the inspectors. This would facilitate the means of giving the inspector-general all the details which it is his duty to condense.

Still, I am going to lay before you, as clearly and fully as possible, the work done by the ten syndicates now in operation, by a table showing the figures gathered from the reports received; the number of cows; the quantity of milk received, and of the butter and cheese made; the money received for these products; the number of days' work done; the short visits paid to test the milk; the number of letters written to patrons who had been guilty of fraud or of negligence; and the frauds authenticated by the inspector of each syndicate.

NAME OF THE SYNDICATES.	Number of factories.	Number of patrons.	Number of cows.	Pounds of milk received.	Pounds of cheese made.	Pounds of butter made.	Money received.	Making days.	Short visits.	Milk-tests.	Letters written.	Fraud discovered.
Huntingdon.....	30	776	.....	.....	1,831,782	.....	\$150,983 18	119	241	3,464	.....	.....
Bedford No. 1.....	28	694	8,330	.....	.....	.....	.....	129	152	2,916	242	.....
Bedford No. 2.....	30	736	.....	.....	.....	.....	.....	138	196	5,033	146	48
Bedford No. 3.....	23	665	4,598	8,985,675	938,876	.....	95,000 00	118	119	4,920	96	96
St. Hyacinthe.....	22	915	.....	.....	1,125,000	.....	.....	128	.....	.....	.....	.....
Bagot.....	29	1,519	7,683	.....	1,420,902	.....	.....	125	.....	8,538	32	4
Megantic and Artha- baska.....	28	800	4,912	11,008,158	1,163,480	.....	101,941 04	100	.....	3,295	.....	47
La Baie du Fevre....	21	900	.....	13,733,970	1,414,415	.....	132,247 80	109	63	3,884	78	24
Chicoutimi.....	15	295	2,301	.....	.....	.....	.....	115	.....	.....	.....	.....
Creameries reg. East of Quebec.....	16	675	.....	8,451,206	.....	382,031	76,980 38	140	.....	.....	.....	.....
Totals.....	242	8,005	27,824	42,179,009	7,894,515	382,031	\$552,108 20	1,221	771	32,050	594	219

From this table incomplete reports which enable us to of patrons, 8005; and

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The number of the guilty patrons c to our protection, and there is great danger

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We also find that do not sufficiently fol ment of their factor; the working stock is not means enough to



From this table, it is easy to show the omissions arising from the incomplete reports I mentioned. There are only three complete columns, which enable us to see: the number of factories, which is 242; the number of patrons, 8005; and the number of days devoted to inspection, 1221.

From the rest of the table, we cannot derive any uniform view.

But we must not be too much shocked at this imperfection. In all new institutions there always occur, at first starting, some of these omissions which experience and habitual work cause to disappear.

I must draw your attention to the numerous cases of fraud, detected by the aid of the different instruments we possess for the test of milk: the lactometer, the creamometer, the lactoscope, the pioscope, and, lastly, that renowned instrument, the Babcock.

Moreover, certain inspectors sent to M. l'abbé Choquette, chemist at the Laboratory of the College of St. Hyacinthe, some samples of milk, in order to ascertain, by chemical analysis, if the milk in question was indubitably adulterated. These analyses almost invariably showed that the milk had been fraudulently dealt with. The inspectors, on the whole, have displayed a zeal worthy of all praise, praise that we would gladly communicate to every patron in particular. Here, there is a serious reflection to make.

The number of frauds discovered is alarming; and no severity against the guilty patrons can be too great. The honest ones have a strict right to our protection, and if a prompt and efficacious remedy be not applied there is great danger that this so important industry may "go by the board."

I may also state that 594 letters were sent, by five of the inspectors, to different patrons, giving them notice that their milk was not of due normal gravity, or that it had not received the care necessary to render it fit for the manufacture of good cheese or of first-class butter; such as cleanliness, straining, aeration and cooling, all of which are necessary to the proper preservation of milk. It is sad to have to mention so frequently such defects in management, faults so easy to be avoided if a little care be exercised. It is a remarkable fact, that the patrons guilty of such neglect are always the most greedy for the division of the coppers after the goods are sold.

I hope that the patrons of the factories will not bear a grudge against me, if I tell blunt truths, loudly and frankly, about some of them, and that they will understand that I am speaking thus for the general good.

We also find that many of the proprietors of creameries and cheeseries do not sufficiently follow up the steps of progress made in the improvement of their factories. The buildings are often inferior, and sometimes the working stock is too small. It may be replied to this that there are not means enough to admit of more being done; but to this I answer first,

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Short visits.	Milk-tests.	Letters written.	Frauds discovered.
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152	2,916	242	48
196	5,035	146	96
119	4,920	96	96
.....	8,538	32	4
.....	3,295	.....	47
63	3,884	78	24
771	32,050	594	219

that, as regards a certain number, it is false economy to keep them in this state of inferiority. As to those who really do not possess the means of fitting up a good factory, I think they had better leave the business alone altogether. Inferior goods do more harm than good.

In some places, too much competition is a partial cause of the imperfection of the installation.

As to the makers, they are generally pretty well skilled in the making of the goods; but they frequently fail in testing the milk, and it is in that line that the syndicates are so indisputably useful. Even as regards the making of the cheese and butter, it is not enough for the makers to know how to go to work at it; there are two qualities that, though essential, are wanting to many of them, I mean cleanliness and a love of work. There are some factories that are, if I may be allowed to use the expression, really in a disgusting state; this is so true that I must give expression to my feelings. The style of work at a factory necessarily brings with it a good deal of dirt, and if the clearing of it away is in the least neglected, it is impossible to keep the factory in fit trim for dairy-work. The maker must have a taste for work and for earnest work, or success is impossible.

I wish to draw the attention of the makers to the imperfection of some of the thermometers. Some I have seen that show three, four, and even five degrees too high or too low a temperature. These instruments should be tested from time to time.

Before commencing the task I have to perform, namely, to demonstrate to you the utility of the syndicates, I must give you an account of my year's work.

I laboured in the service of the Dairymen's Association from the end of April to the end of October. During a good part of May, I was at the school-factory, at St. Hugues, as one of the aides of Mr. MacCarthy, the director; the remainder of the season I was employed in visiting the syndicates in company with their special inspectors, as follows: three times in the syndicate of Megantic and Arthabaska, as well as that of Bedford, No. 3; twice in the syndicates of Bedford, No. 1, Bedford, No. 2, Bagot, St. Hyacinthe, and La Baie du Fèbvre; and once in each of those in Chicoutimi, Huntingdon, and that of the creameries East of Quebec.

I made 140 visits, though I only saw 100 factories, as I returned several times to some of them. I found in store: 13,336 cheeses, which I classified in the following order: 11,969 of the first quality; 1,260 second, and 107 of the third quality; according to these figures, more than a tenth were inferior to a good merchantable cheese.

In the factories I visited several times, I found, in more than one respect, a sensible improvement, and this I attribute to the frequent inspection they received.

I only visited 5 creameries, in which I found 275 tubs of butter, which I classified as being of good quality.

After the hunt to become the working of the very great service which outlay can be made by making this mo

I do not hesitate to manufacture of but annual convention. This, I wish that the information from the few years, as to the factories since last allow me to mention Duguay, of La Baie the seller of the autumn, that for the of any but syndicate cheese-factories we frequently. the people with less experience will not do without be of the same opinion

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## UTILITY OF THE SYNDICATES.

After the humble report I have just made to you, allow me, Gentlemen to become the echo of all those who are in a position to judge of the working of the syndicates, and to say, that they are called upon to render very great services to our dairy-industry. There is certainly no way in which outlay can be made to favour the progress of this trade better than by making this mode of conducting the supervision general.

I do not hesitate even to say, that as regards the, properly so-called, *manufacture* of butter and cheese, the syndicates are more useful than our annual conventions, interesting and instructive as they are. In support of this, I wish that those who are doubtful about what I have said would seek information from those who have been dealers in dairy-goods for the last few years, as to their opinion about the goods produced by the *syndicated* factories since last spring. To facilitate the obtaining of this information, allow me to mention one name among others; that of Monsieur T. N. Duguay, of La Baie du Fèbvre, the proprietor of several cheeseries, and, the seller of the goods of many more than his own. He told me, last autumn, that for the future he would never undertake to sell the cheese of any but *syndicated factories*. We know that it was in that district that cheese-factories were first started in the province of Quebec, and consequently, the people there ought to be at least as far advanced as are those with less experience; and if they find the syndicates so useful that they will not do without them, still more will those who are newer to the trade be of the same opinion.

And there are other men who can also give us good information on this matter: the buyers. They can judge whether the goods coming from the syndicates are in general better than they were in the same places in previous years, when there were no syndicates.

Were there nothing but the frauds mentioned in the reports of the inspectors of syndicates, which were discovered and corrected by them, it would be sufficient to induce all upright men, who are careful of their interests, be they proprietors, makers, or patrons of a creamery or cheesery, to do their best to insure that these establishments be all *syndicated*, because they are all equally interested.

## THE PROPRIETOR.

The proprietor, even if his factory is the best built possible and the best fitted up, if he has in his employment the best maker in the province, would still find it to his profit to have frequent inspection, since the object of the syndicate is to make our dairy-goods uniformly good. Therefore, I say to those who are doing good work: If possible, do better still, and the means thereto is to assist in the formation of a syndicate in your district, in order to induce your neighbours to do as well as you are doing, because you will

evidently suffer, either directly or indirectly, from any mistakes committed by them. For, is it not the case, very frequently, that those who have made the outlay necessary to obtain first-class goods, and have really succeeded in doing so, are disappointed at seeing, when the sales take place, that the difference of price they receive does not recompense them for the expenditure they made? One of the laws of trade is, that the maker of good articles pays for the maker of bad ones. In fact, the purchaser, when he is about pricing two articles of very different quality, will never offer, as the average price of the two, as much as if these goods were both of average quality. And more; the inferior article is invariably of such a kind as to abate the briskness of the demand, and the good articles suffer in consequence. You see, then, that it is the interest of you who make good articles to get your neighbour to make his goods as perfect as yours.

Another reason why you should push forward the creation of syndicates:

Your products are good: to attain that end, you take care that the milk is delivered in good order, and it happens that careless or unscrupulous patrons leave your factory to patronise that of your neighbour who is less particular, less severe than you.

The third and last reason why the proprietor should engage with a syndicate is this:

The makers of inferior goods often take underhanded means to obtain results to the advantage of their factories. One of the most common means is to so adjust the milk-scales that at each weighing a few pounds may be kept back; and, thus, to make it appear that, on the whole, they pay as much as those who have a better reputation as makers.

The institution of syndicates will put a stop to these "dodges," which are so injurious to those who conduct their business honestly.

#### THE MAKER.

It is to the interest of the maker, too, that the factory under his management be frequently visited by one who, although the maker himself is a good workman, may be in a position to give him good advice. For, the inspector, even if, at starting, he be only of moderate ability, cannot avoid obtaining valuable experience during the course of his different visits, and, he must be able to communicate his experience to those who have not had the same opportunities. It is through the connexion between the inspectors and the makers that the latter may profit by the experience of their brother workmen.

Under the eye of a frequent visitor, emulation is excited, the less skilful assisted, and the more skilful strengthened. Besides, this disinterested visitor is in a position to smoothe away the troubles that sometimes arise from the competition between the makers.

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## THE PATRON.

Still more than the maker, should the patron be glad to have a frequent inspection of the factory to which he sends his milk; for the inspector is, of a truth, the protector of the upright patron. The maker ought, doubtless, to give the security that the inspector demands (*réclame*); but if there be dishonest or negligent patrons who bring bad milk to the factory, there are also, unfortunately, makers with too loose consciences; and as the inspector is perfectly disinterested, it is clear he is an indisputable protection to the patron.

Another reason why the patron should desire frequent inspection, follows from those that I gave to the proprietor, when I mentioned the fact that some makers concealed several pounds of milk at each weighing.

As the weight of these weighings is not equal, and as the scales are so adjusted as to keep back a certain given weight, say, 5 lbs on each weighing, it is clear that justice is not done, and that the patron who brings a small lot of milk is robbed of more than he who brings a large lot. Suppose the case of one who sends 50 lbs. : he is credited with 45 lbs, thus losing 10%; while the man who sends 100 lbs, and is only robbed of the said 5 lbs., only loses 5%. The supervision exercised by the inspector will protect the smaller patron, who, from what I have said, is robbed to the benefit of the larger one.

According to my experience, I can affirm absolutely, that the best cure for the tendency of certain patrons to bring adulterated or badly kept milk to the factory, is to keep up the already formed syndicates and to create new ones where there are none at present. This grand remedy against the dishonest or careless acts of the patrons would equally apply to the troubles which are brought about by the competition existing between too ambitious makers.

As a last argument in favour of my thesis, I will mention a well known fact. I speak of the result obtained at the Sherbrooke exhibition, last September.

There, we saw one of the largest shows of dairy-products ever witnessed in the Dominion; they came from Ontario, Nova Scotia, and Quebec, and we are happy to be able to remind our compatriots that the products of our province carried off the palm. The judges, Mr. Robertson, commissioner of Dairy-industry for the Dominion, and Mr. Clement, a great Glasgow importer, could not have been better chosen or more disinterested men.

In favour of my argument I must add that almost all the cheese which won us this honour, was made at syndicated factories.

There was one syndicate there, represented by the products of 27 cheeseries, each of which won a prize. From this syndicate came the

cheese that won the grand-prize, the gold-medal. Well, does any one believe that it is possible to find in the province a place, where there are 27 cheeseries, neighbours of one another and not syndicated, able to produce goods capable of gaining such results as those I have just mentioned? I am sure there is not such a place

#### COST OF SYNDICATES.

As it is clear, from the above reasons, that proprietor, maker, and patron are all equally interested in the organisation of syndicates, so it is equally clear that that they ought to divide their cost equally among them. If the proprietor is also the maker, he ought to pay half the cost and the patrons the other half; but if the proprietor hires a maker, then the necessary sum should be paid one-third by the proprietor, one-third by the maker, and the remainder by the patrons; so that no one would have much to pay, the patrons, particularly, as they generally number fifty to each factory.

As we know, government allows one-half the expenses of each syndicate, up to \$250, and as the amount needed to "run" the syndicate is about \$650, there remains only \$400 to be provided by, say, 20 factories, or about \$20.00 each, and this last amount, being divided into two or three equal shares, is far from being equivalent to the profits those interested will gain from the plan.

Before I conclude, I would advise those who intend to form themselves into syndicates not to enrol more than 20 factories in each; for I think that number amply sufficient to employ the whole time of an inspector, if his work is to be as efficacious as it ought to be.

I close my remarks, gentlemen, by expressing the hope that the trifling essay I have just read to you may avail to establish the associations of which I have been speaking; for I am satisfied they will render most important service to our dairy-industry.

The whole respectfully submitted,

SAUL COTE.

St. Flavien, January 25th, 1892.

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*Mr. Barnard.*—I asked one of the buyers of cheese, who is present, who is one of your inspectors, and who is a purchaser of cheese in various parts of the province, what rise in the selling price would be realised in consequence of the institution of syndicates. He told me that he had not the slightest doubt that cheese from syndicated factories was worth, and had been sold for, at least a quarter of a cent more than cheese

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from the non-syndicated factories. A quarter of a cent does not seem much ; but I must tell you that, in the district of St. Hyacinthe, the banks paid out this year, nearly half a million dollars for the products of the dairy.

Suppose cheese is worth 10 cents a pound : this sum (\$500,000) represents the sale of five millions of pounds of cheese, and a gain of a quarter cent a pound, realised by the action of the syndicates, would give us the pleasant sum of \$12,500 gained, by the work of the syndicates alone, in the district of St. Hyacinthe ; and, that, without reckoning the ulterior profit, for this is only the first season of their working. For the English market is not yet inclined to take our cheese ; but when the report of Mr. Macpherson shall be known in England, this our cheese will be worth half or three-fourths of a cent more, because there is already a difference of three-fourths of a cent between the price of Western Ontario cheese and what is called " French " cheese. You see, then, how greatly you are interested in the creation of syndicates, one-half of the cost of which the government, whichever party is in power, will, I hope, pay. You are aware that the action of your president, last year, was so efficacious with the government that, by the united efforts of us all, Mr. Fisher, M. Bernatchez, and the committee of the association, we succeeded in obtaining this immense favour, which will soon be worth hundreds of thousands of dollars to the province.

*M. Bernatchez.*—No merit in this is due to me. It is all due to the government. As Mr. Barnard says, I hope that, whatever party is in power, the government will continue this grant, and, if possible, increase it.

*M. Bourbeau.*—I must not allow to pass unnoticed the fact that we have recognised the great services rendered by the united syndicates of Megantic and Arthabaska ; neither would I forget the name of M. Drouin, our inspector. He did his best to render us the services we expected from him, in accordance with the object we proposed to ourselves. M. Chapais, too, had the goodness to make some experiments in the district of our syndicate of cheese-factories. He did us great good by teaching our makers how to test milk by means of the instruments he brought with him. For those who are about setting up cheeseries, it seems to me indispensable that they should not fail, from the first, to secure the services of an inspector, who shall visit the factories from time to time during the season ; at least, this is the fruits of my experience. During last season, I set up a cheesery ; at starting, I had not the experience necessary to manage it myself properly, and I should certainly not have been able to render justice to the patrons, without the aid of the inspector who visited us so often ; and the more so, since, while recognising their services, I believe that the syndicates save us from the very great losses we should not fail to incur, seeing that we often are obliged to advance gropingly (*à tâtons*), so to speak, not knowing whether the implements we use in the factory are good, or if the

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makers we hire are competent. Sometimes, when we are making a sale of cheese, we feel that we have been going along in the dark, and find that it is only cheese of the second or third quality, which leaves us with a loss of \$40.00 or \$50.00.

Thus, Mr. President, the services we have received deserve special mention, and were I to offer any advice to those who have cheeseries where there are no syndicates, I should recommend them to establish one at once. I believe that the time spent in making arrangements for it, and the small sum they would have to subscribe, would be largely compensated by the profits they would derive from it in the first season. The subscription of my cheesery to the expenses of the inspector, for the whole season, for his visits, for the tests of milk made at the factory, and for the instruction given to the maker, did not exceed \$10.00. I think that is little enough; at any rate, it is but a moderate outlay on the part of him who contributes this sum.

So, Mr. President and Gentlemen, once more I would encourage, I would recommend the creation of syndicates, and I think it would aid us in making a far better cheese in every part of the province if we had, in every district, syndicates such as exist now.

*Mr. Fisher.*—I can, perhaps, add something to what Mr. Barnard has just said. During the Montreal exhibition, last autumn, I was talking to several of the principal cheese-merchants of the province. One day, I happened to be with three of them, one of whom said: "In your district (Bedford), cheese has risen in price this year a quarter-cent a pound; that is, it has approached in price to that of the best markets of Ontario. Your cheese does not yet equal Ontario cheese in value, but is a quarter-cent dearer than it used to be." I made a slight calculation as to how much the syndicate had gained. We made that season nearly two million pounds of cheese in the syndicate, and, at a quarter of a cent a pound, that would give us an increased profit of five thousand dollars the season. Our inspection only cost us \$400.00: that is, that for an outlay of \$400.00, we have gained \$5,000.00. I know of no other commercial transaction capable of returning such a profit.

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At the request of M. J. L. O. Vidal, M. J. de L. Taché submitted to the meeting a novel and simple milk-tester, called the "Little detective."

#### ACID MILK OR SOUR MILK.

*M. Bernatchez.*—If you will allow me, Mr. President, I should like to put a few questions to M. Côté about the manufacture of cheese.

How would you treat milk that is acid, as regards the adding the rennet?

*M. Côté.*—If I take in any,—I should as would make it in minutes, I would

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*M. Côté.*—If I

*M. Bernatchez*

*M. Côté.*—That late on the quantity the milk requires it more, but if I th

*M. Bernatchez* farmers cannot go weather we are ob may be acid, with Macpherson came acid: for the farm their milk in pro how much rennet I told him that as I was wrong, and for, if I remember quantity of rennet, too fast, and the cl I think that, in su nished. By lower milk coagulate in fast as possible, an an hour or an hour because if it stays t whey remains in it when grinding the loss being incurred

In my opinion closer cheese, than cheese that will ne that is slightly acid than that which re of an hour are in m

*M. Côté.*—It w milk.



*M. Côté.*—If I were obliged to accept sour milk—I always try not to take in any,—I should set it as soon as I could, giving it as much rennet as would make it coagulate as quickly as possible. Instead of allowing 45 minutes, I would make it coagulate in 15 minutes.

*M. Bernatchez.*—Do you think that acid milk is subject to be sour ?

*M. Côté.*—If it be acid, it is already sour.

*M. Bernatchez.*—Do you put the same quantity of rennet, or less ?

*M. Côté.*—That depends upon the degree of acidity. I do not calculate on the quantity of rennet, but, on the length of time. If, in my opinion, the milk requires more rennet to make it take in 15 minutes, I would give it more, but if I think it is acid, I would use less.

*M. Bernatchez.*—It often happens in our rural parts, where the farmers cannot get cold water to cool their milk, that occasionally in hot weather we are obliged to receive acid milk. I have proved that milk may be acid, without being sour, and make good cheese. When Mr. Macpherson came to lecture to us, the milk we were receiving was generally acid: for the farmers did not use cold water, and did not know how to keep their milk in proper condition. At that time, Mr. Macpherson asked me how much rennet I was in the habit of putting to the 1,000 lbs. of milk. I told him that as the milk was very acid, I diminished the dose; he said I was wrong, and he did just the contrary; but that time *he* was wrong, for, if I remember, his milk coagulated too quickly. If we increase the quantity of rennet, when the milk is acid though not sour, it will coagulate too fast, and the cheese will be dry. After an experience of several years, I think that, in such a case, the dose of rennet should be slightly diminished. By lowering the temperature, I have succeeded in making the milk coagulate in 25 minutes, neither too firm nor too soft. I work it as fast as possible, and when the whey has left the curd, I leave it at rest for an hour or an hour and a half. I do not let the curd stay long in the vat, because if it stays too long, it decomposes, and, when ground, some of the whey remains in it. With acid milk, by working it quickly, we succeed, when grinding the curd, in expelling the whey in a very clear state, no loss being incurred.

In my opinion, slightly acid milk is better for cheese, and will give a closer cheese, than milk that works more slowly, and will make a light cheese that will never grow very firm. M. Painchaud, too, prefers milk that is slightly acidulous. Cheese made from such will have more body than that which remains two or three hours in the whey. Three-fourths of an hour are in my opinion enough to secure a good body to the cheese.

*M. Côté.*—It would be a bad plan to ask the patrons to bring acid milk.

*M. Bernatchez.*—I don't ask them to do so.

*M. Côté.*—Not only, should they not be asked to bring it in that state, but they should be forbidden to bring acid milk.

*M. Bernatchez.*—There is often so much competition, that one is obliged to accept it. I believe that with acid milk we can succeed in making as good cheese, quite as good.

*M. Côté.*—Do you get as good a yield?

*M. Bernatchez.*—Decidedly, provided that when it is ground the whey runs out in a very clear state.

*M. Côté.*—I admit your conclusion in cases when the milk is not too acid. We know that milk should be allowed to gain, by age, a certain degree of acidity. As you are a better judge of this than your patrons, demand good milk from them, and let it age at the factory. Even if the patrons have not cold water, they can get aerators. When milk is thoroughly aerated, cooling is not so absolutely necessary. I think we sin more frequently in this way than as regards the cooling. You say that acid milk is not *sour* milk; I suppose you only employ the word *sour* to express *too acid* milk.

*M. Chapais.*—There is a distinction between *advanced milk* and *sour milk*. We must not conceal from ourselves that, when in the cow's udder, milk is alkaline. It leaves the teat *alkaline*, and in two minutes it begins to give an *acid* reaction, after which it goes on becoming more and more acid. There is a wide margin between the moment when it leaves the udder and the moment when it has become positively sour. So wide a margin, that the process may vary every minute. It would be of great importance if we could settle the question concerning *advanced milk*. Otherwise, we may keep on playing with verbal disputes for ever so long.

*M. Côté.*—M. Chapais says that, as soon as the milk leaves the udder, its *acid* acts on litmus paper. M. Bernatchez probably speaks of milk that is *acid* to the taste?

*M. Taché.*—Mr. Macpherson advises that milk be warmed if it seem not to be stale enough. You prepare it so to have it exactly right. You put a teaspoonful of rennet into 8 oz. of milk, and if it coagulate in 15 or 18 seconds, it is all right, and the time to set the bulk has come: it is not *sour* milk, but only *advanced* or stalish.

*M. Côté.*—I know other makers who are satisfied with 12 seconds. Mr. Macpherson wants 15 to 18, which is better: too long a time is better than too short a time. The relative quantity of rennet has often been discussed, but the question really depends upon the time allowed

*A Maker.*—What of frozen milk? I th

*M. Côté.*—I do never been frozen: milk; I have succee

*The Maker.*—What from frozen milk?

*M. Côté.*—I can less. I should like of butter.

*M. Chicoine.*—I dealt with frozen mi

*The Maker.*—What I may say that the l question to be cons already, and I do no

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*The Maker.*—The milk kept at a mode was inferior, but it v my own intallibility, the makers in gener

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*M. Trudel.*—It is best.

*M. Côté.*—Is the

## BUTTER FROM FROZEN MILK.

*A Maker.*—Would you please to give us a general idea of the question of frozen milk? I think it would interest many makers.

*M. Côté.*—I do not think it would turn out as well as milk that had never been frozen; but I know that good butter can be made from frozen milk; I have succeeded myself in making good butter from it.

*The Maker.*—Would you give me an idea of the yield to be expected from frozen milk?

*M. Côté.*—I cannot answer positively, but I fancy the yield is rather less. I should like to hear Mr. Chicoine's opinion: he makes a great deal of butter.

*M. Chicoine.*—I cannot give an opinion on this point, as I have never dealt with frozen milk.

*The Maker.*—Without having had so much experience as M. Chicoine, I may say that the butter is not so good, but I should like to leave the question to be considered by the mass of makers. I have made some already, and I do not think it was so good.

*M. Côté.*—What was the yield?

*The Maker.*—The yield was nearly as great as would be expected from milk kept at a moderate temperature. The flavour, the taste of the butter was inferior, but it was not much less in quantity. I do not believe in my own intallibity, so I would rather leave the point to the decision of the makers in general.

*M. Côté.*—I think you will find it difficult to make as good butter from it.

*A Delegate.*—Do you mean to compel your patrons to freeze their milk?

*The Maker.*—By no means; that is not the point. The question is; can frozen milk be used to make butter?

*M. Trudel.*—I do not mean to say that the butter is bad. I have made, and am still making, winter-butter; I freeze the milk in the vat, as soon as it arrives, and thaw it a day in advance of its being churned. I am not an expert as regards butter, but I think ours is pretty good.

*The Maker.*—I don't say it is bad, but that there is a difference between very good butter and butter made from frozen milk.

*M. Trudel.*—It is not bad, only a little short of being as good as the best.

*M. Côté.*—Is there any difference in the colour.

*M. Trudel.*—Yes, it is white and must be coloured.

*M. Taché.*—This ought not to deter those who intend to make winter-butter. Sometime ago, a French paper published an essay on the subject, and experiments have proved that it is possible to make as good butter from frozen milk as from milk that has never been frozen. It was shown that the *freezing of milk*, produced no change in it that of itself could make the *milk bad*. It may be, that the maker has more trouble in making the butter, but, with equal care, it is asserted that *as much good butter* can be made from *frozen milk* as from *milk that has never been frozen*.

*M. Trudel.*—Mr. MacCarthy to whom I spoke about this point last winter, held this opinion. Once more; I am not an expert in butter, but ours is well liked, and fetches the ordinary market price.

*M. Chapais.*—The periodical, "*L'Industrie Laitière*," published, last year, a noteworthy article on this subject. The conclusion arrived at was, that the freezing of milk made no difference, provided that all the necessary precautions be taken, that is, that the thawing of the milk be so managed that no taint attacks it during the operation. The danger is that the milk be thawed out too fast, either by warming it up too rapidly, or by taking other means, which may communicate to it bad properties. If my memory serves me, the article in question asserted that if all these conditions be observed, as good butter can be made from *frozen* as from *unfrozen milk*.

#### FROZEN MILK AND CHEESE.

*A Maker.*—Will you give me your opinion on the making of cheese from frozen milk? Will it make any difference for that purpose?

*M. Côté.*—I should fear to use it for cheese more than for butter. If one or the other must be made from it, I should prefer making butter. Still, I know passably good cheese has been made from it, but I think there must be impediments.

*M. Bourbeau.*—Allow me to make an observation. I am not a maker but I was a proprietor of cheese-factories, and I am a shop-keeper and a farmer, both on a small scale. In these capacities, I am able to judge of the financial position of the farmers of our district. I believe every body will acknowledge that, in our district, where we used to drive a profitable trade in winter, affairs are utterly changed since the creation of cheeseries took place. The forest has disappeared, and the season for trade is changed. Now, our greatest run of business occurs in summer, for it is at that time of year that the farmer has most money in hand. What I want to say, Mr. President, is this: the discussion which has just begun is a very interesting one, since it will probably have the effect of inducing the proprietors of creameries and cheeseries to keep them going all the winter, and to follow the advice Mr. Barnard gave us to-day, namely, how to feed cows

from the time the grass is green when they are sent to the stalls and dried off at the end of the season.

I think we are a little afraid to try to find means to keep the butter throughout the winter, that as soon as the winter comes, the butter keeps, that as soon as the summer comes, there is not much butter. There is not much butter, everybody complains. If this industry can be kept going all the year, there is less profit in winter than in summer, seeing the circulation of the butter, those horrid rumours, those horrid trade dull. I therefore, in order to settle the question, if the proprietors would keep the butter out the winter.

*M. Côté.*—One difficulty is by freezing it a way, it may have made cheese full of dirt. The patrons, who buy the butter, was delivered, profiteers, this is a very great nuisance.

*M. Vidal.*—I believe in ten years. For the last winter. At Ste. Croix, all the winter, and but for the latter begin to work, the cheeseries that are

*M. Côté.*—There is no doubt. The milk is taken to the factory and re-frozen. It is better to rather advise that the maker be allowed to keep the cleanliness.

*A Maker.*—I have heard. If I do not understand you, my experience is that you made butter from it and it is a taste.

*A Maker.*—Two years ago, I heard the question as to whether it is in its common state).

from the time the grass ceases to be fresh and abundant up to the time when they are sent into winter-quarters, so that they shall no longer be dried off at the end of the autumn.

I think we are about to agree to follow Mr. Barnard's advice, and to try to find means to continue our manufacture of butter or of cheese throughout the winter. I have ascertained, in my business as a shop-keeper, that as soon as the cheeseries close, or at longest a month afterwards, there is not much money left in our district. When money is very scarce, everybody complains; not only the shop-keepers, but everybody. If this industry can be kept going from the fall, although it may be with less profit in winter than in summer, we should have the satisfaction of seeing the circulation of money prolonged, and a stop would be put to those horrid rumours that abound every winter, that money is scarce and trade dull. I therefore hope that the meeting will continue this discussion, in order to settle the question: that it would be a benefit to the country if the proprietors would continue the making of butter and cheese throughout the winter.

*M. Côté.*—One disadvantage of frozen milk is that careless patrons find by freezing it a way to hide its defects. I have often heard people, who have made cheese from frozen milk, say that it was not always free from dirt. The patrons, knowing that this could not be seen when the milk was delivered, profited by it to conceal the effect of their careless treatment; this is a very great nuisance.

*M. Vidal.*—I belong to Lotbinière, where cheese has been made for ten years. For the last seven or eight years, cheese has been made in winter. At Ste. Croix, winter-cheese is also made. There, cheese is made all the winter, and butter, in the creameries, up to the end of December; the latter begin to work in April. At Cap Santé and at St. Augustin, there are cheeseries that are successfully carried on all the winter.

*M. Côté.*—There is a factory at St. Edouard that works all the winter. The milk is taken to the factory, thawed for the purpose of being weighed, and re-frozen. It is affirmed that the cheese is not so good. I would rather advise that the milk be delivered at the factory before being frozen, that the maker be able to examine it, judge of its smell, and of its state of cleanliness.

*A Maker.*—I have the highest respect for those who have just spoken. If I do not understand cheese-making, I will at any rate, communicate to you my experience in butter-making. I have frozen milk myself, I have made butter from it after thawing it out, and I found that it had a bitter taste.

*A Maker.*—Two years ago, in 1890, I took in frozen milk (I have just heard the question asked whether it would give as good a yield as when in its common state). The milk that I was receiving about the above time

gave me from 5 to 5.25% of butter, but with the frozen milk I only made 4.70%. As to the quality, I would rather sell it than eat it. As I only sold a small quantity of it, the shopkeepers did not find fault, but they did not want any more.

*M. Brodeur.*—I have made butter all the winter, and I still make a good deal. We have made some bad butter. Some one remarked, just now, speaking of cheese, that it was not far from being as good as that made of unfrozen milk; but butter which is not far from being as good as good butter, cannot be called good. Butter is either good or bad. I think it would be dangerous to come to meetings like this and recommend people to make butter from frozen milk, at least, until we know something more about the process of manufacture. It would not be wise of us either to recommend it or even to tolerate it.

*M. Taché.*—As a friend of M. Brodeur, I beg to enter my protest against what he has just said. There is one thing we must not forget. I will quote a discussion that took place last year on a point that is nearly analagous to this. The subject was, the aeration of milk. Last year, M. MacCarthy having stated that the aeration of milk, under ordinary conditions, was very advantageous as regards the manufacture of cheese, Mr. Dellicour asserted that, in Europe, the method was condemned, and that the immediate refrigeration of milk, as it left the cow's udder, was not sufficient, and must be followed by Pasteurisation. M. MacCarthy started from this principle, that our makers had learnt their business with a view to make cheese and butter in summer only. Our manufacture is almost exclusively carried on in summer. Out of seven or eight hundred cheeseries, there are probably less than 25 that work in winter.

It may be said that our makers, having never learnt, do not know how to make cheese in winter. To show how the slightest change in the conditions of manufacturing may affect the product, I will cite you a case. A good many makers, when they are required to make cheese from the Saturday evening's milk, declare that they cannot make so good a cheese with it as with that of Saturday morning, because they have been accustomed to deal with the milk of Saturday morning, and because the experience they have had applies to the state in which the milk is when they receive it in the morning. If the condition of the milk is altered, they can no longer make as good cheese. It is evident that the methods of manufacture may change, and if one has not learnt one's business so as to be able to apply it to a novel method of manufacture, one has no right to say that the novel system will not give as good results.

M. MacCarthy said that aeration was suited to our manufacture. If the milk be cooled, and put into a condition different to that in which our makers are accustomed to deal with it, they must be taught their business afresh. You are aware that the greater part of the Danish butter is made

in winter. I saw it of the cows had a flow of milk is the universal reputation of butter in winter on a severe climate, the

Some one spoke of milk. At this season the table,—and it is taste,—we try, I say to be the best way. In point, I do not think winter, even with

*M. Brodeur.*—I am hindering the attempt say that our association so before having made

You spoke of butter they are correct. But Danes make butter in

*M. Taché.*—I say made in winter, with butter-making at the business that has to

*A Maker.*—Approved that the

*M. Brodeur.*—I meant to say that I for I am not against not to be recommended how to deal with it.

*M. Taché.*—We

*M. Brodeur.*—I particularly, in winter until we have reached milk for seven or eight from them that they butter in winter, but butter with frozen milk instructions how to set an example of on the 1st of December

in winter. I saw it stated lately, that, by the 1st January, 50 % to 55 % of the cows had calved. In that country, then, the time of the greatest flow of milk is the winter. You know that Danish dairy-products enjoy universal reputation. It may be asserted, then, that it is possible to make butter in winter out of frozen milk, since, in the Danish farmeries, in that severe climate, the milk is of necessity subject to be frozen.

Some one spoke just now of a bitter taste in butter made from frozen milk. At this season, we endeavour to keep milk in a proper condition for the table,—and it is there that we find out if milk has or has not a bitter taste,—we try, I say, to preserve milk by keeping it cold, and that is said to be the best way. Before we have made weighty experiments on this point, I do not think we ought to condemn the manufacture of butter in winter, even with frozen milk.

*M. Brodeur.*—I did not mean to give my opinion for the purpose of hindering the attempts of those who intend making winter goods. I only say that our association cannot and ought not to induce its members to do so before having made weighty and conclusive experiments thereon.

You spoke of butter-making in Denmark. I admit your *data*, I think they are correct. But you said that the milk was frozen; I admit that the Danes make butter in winter, but when the milk is frozen.....

*M. Taché.*—I say that it is impossible that all over Denmark butter is made in winter, without some of the milk being frozen. I admit that butter-making at that season presents special difficulties, and that it is a business that has to be learnt.

*A Maker.*—Apropos of the loss from the freezing of the milk; has it been proved that the yield is diminished?

*M. Brodeur.*—I fear I have not expressed myself clearly. I never meant to say that I was opposed to making butter and cheese in winter, for I am not against it; but I said the use of frozen milk in winter ought not to be recommended before we are in a position to teach the makers how to deal with it.

*M. Taché.*—We are of the same opinion, then.

*M. Brodeur.*—I am heartily in favour of making cheese, and butter particularly, in winter. We shall never get large profits from our herds until we have reached that result, that is, as long as our cows only yield milk for seven or eight months out of twelve, we shall not draw the profit from them that they ought and are able to give us. I approve of making butter in winter, but I think it is injudicious to recommend the making of butter with frozen milk, until in due course we can give, at the same time, instructions how to manipulate frozen milk. I think I have done my part to set an example of winter-butter-making, since our factory only closed on the 1st of December.

*M. Côté*—You made cheese up to December 1st ?

*M. Brodeur*.—Yes.

*M. Côté*.—With frozen or unfrozen milk ?

*M. Brodeur*.—With unfrozen. As long as we oblige our patrons to bring us unfrozen milk and refuse to take it in a frozen state, it is like any other bargain ; our conditions are that we will only accept unfrozen milk, and our patrons never bring us any frozen.

*M. Taché*.—The board of directors of the dairymen's association has endeavoured to obtain from the government a grant in favour of a winter-school. I am sure the association will do all in its power to procure for the public instruction in the manufacture of dairy-goods during the winter. That to which I am opposed, is that people should say that it is dangerous to freeze milk. I do not say that the milk is any the better for it, but I say that everything tends to show that it is not injurious ; and I feel that the efforts that every one is making to succeed in the winter-manufacture, ought to be employed in finding out the best way of treating frozen milk in the making of butter and cheese.

*M. Côté*.—How can we ascertain if the milk is clean, if it comes frozen ?

*M. Taché*.—You have only to thaw it.

*M. Bourbeau*.—I am very glad that I have had an opportunity of listening to this discussion. I think I shall take *M. Taché's* view of the matter. I can do no less than pronounce in favour of manufacturing butter in winter and in summer. To arrive at a solution of this problem, which at first sight seems rather a difficult one, we have heard the opinion of all the makers present. The greater number seems to be opposed to it, but *M. Taché* has shown us that want of practice in winter-manufacture is the cause of their objections. As he announced that a school will be started to teach the best methods of making butter and cheese in winter, this establishment will doubtless receive all the encouragement it deserves ; and we shall in this way arrive at important results, interesting to all who are concerned in the making of butter and cheese. If we are desirous of drawing large profits from our farms, if we wish our farmers to prosper, we must help them to extract the greatest possible returns from their milch-cows. As *M. Brodeur* remarked, six or seven months are not enough to get all possible profits from our cows.

So much have I at heart the continuance of the manufacture of butter and cheese throughout the winter, that I shall return home satisfied with my visit to St. Thomas.

*M. Taché*—One great objection has been pointed out to me: the difficulty of keeping milk unfrozen in winter, for which purpose it must be set in a warm place. Now, in some farms, this warm place might perhaps

be a stable or a corner, where it will not do. It is a can and putting it on a stove to keep a small fire would keep without the surroundings of the

*Mr. Fisher*.—To produce much pleasure. I can do it in years, and I always do and I have always done the twelve months very carefully fed as part of her food.

At present I have in the fall, and the week 105 lbs. of butter you, that you can have if you feed your cows can get from the do. Instead of feeding we can get more are making now for summer. That makes

I was rather surprised during the winter making butter than present, I should be that season to make winter, the milk is possible to get all fatty matter in the more butter it yields butter-fat, it is all cheese ; but let you 7% of fat, and you reasons I think it produces cheese. I should like sent, and what the

*M. Brodeur*.—tion. Last winter,



be a stable or a cowhouse: that will not answer. Or, perhaps, it might be a corner, where old boots and all sorts of rubbish are thrown: and that will not do. It is clear enough that the patrons would prefer taking their can and putting it in a place where it would freeze at once, to lighting a stove to keep a special room at a regular temperature, where the milk would keep without freezing, and without suffering any injury from the surroundings of the place.

*Mr. Fisher.*—The remarks of some of the gentlemen, who advised us to produce much more milk in winter than we do now, gave me great pleasure. I can add this: I have been making butter in winter for several years, and I always manage to have my cows drop their calves in the fall; and I have always found that cows calving in autumn give more milk in the twelve months than the spring-calved; is to say, if a cow is very carefully fed during winter, and, especially, she must be given silage as part of her food.

At present I have 17 cows in milk. With these 17, 14 of which calved in the fall, and the remaining three will calve before spring. I made last week 105 lbs. of butter. That makes nearly a pound a day a cow. I assure you, that you can have as much milk and make as much butter in winter, if you feed your cows well and keep them in a suitable cowhouse, as you can get from the same cows on pasture in summer. It is easy enough to do. Instead of feeding our cows all the winter, and making no profit, we can get more profit in winter than in summer; for all the butter we are making now fetches 25 or 30 cts. a pound, instead of 15 or 20 cts. as in summer. That makes a vast difference in the quantity and in the price.

I was rather surprised to hear that there were some cheeseries working during the winter. I think they would gain a great deal more by making butter than cheese in winter. If there is any winter-cheese maker present, I should be glad to know how many pounds of milk it takes at that season to make a pound of cheese. At the end of the season, during winter, the milk is very rich, and with such rich milk I do not think it is possible to get all the butter-fat into the cheese. I fear there is a loss of fatty matter in the whey, while if butter is made, the richer the milk the more butter it yields. It is said that if the milk contain more than 4% of butter-fat, it is almost impossible to get the whole of that fat into the cheese; but let your milk be as rich as you please; let it test 5, 6, even 7% of fat, and you can get the whole of it into your butter. For these reasons I think it pays better in the winter to make butter than to make cheese. I should like to know if there are any winter-cheese makers present, and what they think of my remarks.

*M. Brodeur.*—While we are about this subject, I will ask you a question. Last winter, I was advised to put, at this time of year (after the 1st

December), one fifth of water into the milk to make the cream rise. It is said to give good results. I have followed this advice and I found it answer. What is your opinion about it ?

*Mr. Fisher.*—I, too, have tried it, and I do not find it answer. At a meeting held at our place, in the Bedford district, three weeks ago, at which Prof. Robertson, the Dominion dairy-commissioner was present, the same question was asked. He told us that, after many experiments had been made, both at Ottawa and in the States, it was decided almost everywhere, that it was of no use. It is true that if the milk is too rich it is more difficult to get all the cream from it. This is a fact every one remarks at the end of the milking season. M. Chapais most likely can tell you more about these experiments than I, for Mr. Robertson has made many, and M. Chapais must be possessed of all the information connected with them.

*M. Chapais.*—This idea has been promulgated in many places during the last two years. From what Professor Robertson tells me, the conclusion has been reached that the process does not bear much fruit. There is another method pointed out for the easier separation of the butter from the cream ; the addition of hot water to the cream ; to the *cream*, not to the milk. This has been productive of benefit.

*M. Bourbeau.*—I am sorry there is no winter-cheese maker present. A question has been put that remains unanswered.

*M. Vidal.*—I am not a maker, but I am the friend of some of the makers, and I have given some time to the study of this question, so I will say a few words about it. It is an interesting question to me, but I can only repeat what the makers have told me.

There is one certain fact, told me by a patron, a man who keeps from 20 to 30 cows, and who daily, even in winter, travels 9 miles in taking his milk to the factory. He told me that it paid him better per lb. of milk, and that he got the greater quantity of cheese in winter. So, even if he lost a little fat, the quantity could not be much, since he found the yield of cheese to be greater from the winter than from the summer milk. Now, if it would be agreeable to the Vice-President and the directors of the association, I would communicate with M. Hamel, of St. Edouard, M. Daigle, of Lotbinière, and other makers at St. Augustin, all of whom visit my shop, and send you their report. They are intelligent workmen, whose winter-factories I have visited. M. Daigle's factory for winter-work is quite different from his summer-factory. There are two: one for summer, one for winter. The factory that is worked for cheese in summer does not work in winter, and the winter-factory is silent in summer. I know that, there, special conditions are laid down: if the milk *must* be frozen, M. Daigle advises the patrons to freeze it immediately. The frozen milk is taken to the factory in vessels that are loaded on to the sleighs like logs of wood. There are special apparatus to receive it at the factory. I do not

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know whether steam is used, but it is thawed out, that it may be inspected; and of course it could not be got out of the vessels without thawing. Then, it is weighed and run into large vats, the cheese being made the next day. I heard the opinion of M. Jacques; he declared that the cheese was almost as good; he even went so far as to say that it was quite as good (*as summer cheese*). In my opinion, the cheese was *perfectly* as good, only care must be taken that it do not freeze.

M. Jacques selects a mildish day; he has special carriages for transporting his cheese to Montreal, so as to deliver it before it freezes. If cheese be frozen it is spoilt.

*M. Côté.*—The Lotbinière people make up their cheese into small shapes. They do not make 70 lb. cheeses, but half that weight, as well as small shapes, 5 lbs., 3 lbs., &c. Their cheese is more or less soft; cheese for local consumption.

*Mr. Fisher.*—Would it bear exportation to England?

*M. Côté.*—I do not think so. It is for local use, and would not take on the English market; it is not firm enough. It is made expressly for the consumption of Quebec and its suburbs; it would not be saleable at Montreal, as it ferments very rapidly.

*M. Bourbeau.*—A fortnight ago, as I was travelling on the railroad, I met an inspector-general, who introduced me to a maker of winter-cheese, a M. Coulombe. I had time to get only a very little information from him, and I can only tell you what he told me. I asked him different questions, such as:

In what state do you receive your milk? He replied: neither frozen nor liquid, but between the two (*entre-gelé*).

How many pounds of cheese do you make per 100 lbs. of milk? Nearly 12½ lbs.

How much does your cheese fetch at Quebec? 9½ cents a pound, was the reply. This was at the beginning of January, this year.

How much does the patron receive? He answered: 95 cents per 100 lbs. of milk.

I had no time to talk more at length with him, but this conversation gave me great pleasure, and made me feel inclined to work my cheesery next winter.

*Mr. Fisher.*—This cheese must have been intended for the local market. It is almost impossible to make so much out of 100 lbs. of milk for the English market. This local market is probably not an extensive one, and if this kind of cheese is made in many factories, the price of it will soon fall.

*M. Bourbeau.*—One word more and I have done, you say that, if we inundate the local market with this sort of cheese, the business will not be so good, and we shall lower the price of cheese in winter. Well, I don't think there is more harm in making such cheese, than there is in making all the inferior butter that is made in the province of Quebec.

*A Delegate.*—I am not a cheese-maker, but I have tasted this cheese at Quebec and I do not think it is good.

*M. Taché.*—Mr. Macdonald says he has made as good cheese in December as in April, and as good with frozen as with unfrozen milk. The only difference is that the former takes longer to warm up to the proper temperature for *setting*. To make good cheese from it, it is sufficient to bring it to the proper state of staleness (*avancement*) for the reception of the rennet. Mr. Macdonald has made as much as 14.36 pounds of cheese from 100 lbs. of milk, and this cheese was as fit for exportation as any he made during the season. He had made a bargain for August, September and October ; he sold at 12½ cents, and the cheese was accepted.

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### CLOSE OF THE CONVENTION.

THANKS OFFERED TO THE TOWN OF MONTMAGNY.

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*Mr. Fisher.*—Before closing this convention, I, in the name of the Dairymen's Association of the Province of Quebec, beg to offer our most heartfelt thanks to the town of Montmagny for the kind reception it has afforded us. I wish I could express myself better in French, gentlemen, but I have certainly felt great pleasure in coming hither, to the abode of my friend M. Bernatchez, whose acquaintance I made for the first time in his position of Chairman of the Committee on Agriculture of the Legislative Assembly, a position he has occupied for several years with great dignity, and with much benefit to the cause of agriculture. I have also had an opportunity of visiting my good friend M. Choquette, your member, by whose side I sat for four sessions in the House of Commons, where I fully appreciated the activity and intelligence which he displayed in the discharge of his duty as a member. I am delighted at having had this opportunity of visiting your district, and I hope on some future occasion to have the pleasure of viewing your fine scenery in summer. Lastly, I thank the town of Montmagny once more for its kind reception of us. Our President, M. Montminy, who is, unfortunately rather indisposed this evening, asked me to take his place at this last session, and to express to you his personal thanks.

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All that remains is for me to declare the labours of this convention at an end.

The session then closed.

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As was stated at p. 27, we insert here the

### LECTURE BY M. J. ADELARD CARON.

#### THE SETTLER AND THE DAIRY.

*Mr. President and Gentlemen,*

I feel more than flattered at having to address such an audience, and in accepting your courteous invitation, I, on many accounts, pray for the indulgence of my hearers. My youth, my want of knowledge, would lead me, in the presence of the brilliant men who compose this audience, to be silent, had I not a duty to perform, in the name of the Canadian farmer, as whose humble representative I appear before you to-day; and this duty is the dearer to me because it is impressed upon me by gratitude.

For, indeed, gentlemen, what a debt of gratitude do we not owe to the generous founders of this, the Dairymen's Association, for the precious instruction, the numerous benefits, conferred upon us by this association, still of recent origin!

We have not forgotten, I suppose, that cry of alarm, of serious distress, that a few years ago pervaded our country: *Farming does not pay*. The land, impoverished by a ruinous system of cropping, no longer yielded its accustomed harvests; the farmer, discouraged, was on the point of giving up the fields, that he had watered with his sweat; and the future was growing more and more gloomy for the people of the rural districts. Providence, then, intervening, suggested the formation of this association, which was to alter the whole of our method of cultivation, and to restore the expatriated family to its deserted hearth.

The past year has seen a new stride along the road of progress taken by this association, by *the organisation of syndicates*, commissioned to watch over the manufacture and preservation of butter and cheese.

To whom is the honour of having promoted these happy changes due, if not to the founders and directors of this association?

Gratitude, then, Gentlemen, great gratitude is due to the generous men who founded and who sustain this association!

Gratitude, too, is due to our government, who are doing all in their power to promote the work of this industry, so beneficial to the farmer !

Gratitude, lastly, is due to all friends of the good cause, who, every year, take part in our deliberations, and help us with their presence and their advice !

But, Mr. President, if your association has succeeded in doing some good among us, if it has been able to cause hope to spring once more to life in the bosom of the Canadian family, how much still remains for it to do ? How many new cantons remain to be organised ? What immense forests, still intact, await the axe of the settler ?

And, pray, do not think, gentlemen, that the older parishes alone can benefit by dairying. The new settlement, a few year subsequent to its being cleared, may also have its cheesery ; and the intelligent settler, guided by your wise advice, will soon find the means of promoting its success.

I have been warring with the forest for the last ten years, and I should like now to give certain pieces of advice to settlers, to enable them to avoid the blunders and errors I have myself made ; and to show to the directors of the association a novel mode of dispensing their benefits around them.

The settler, as well as the established farmer, must follow a certain rotation, and he who starts for the bush, with a determination to hew out of it a patrimony, must arm himself with courage and energy. For, when the first din of war shall resound, when the murderous axe shall have awakened the slumbering echoes of the forest, the settler will see, ramping against him, obstacles and difficulties of all kinds. His daily bread must be moistened with the sweat of his brow ; he will have to contend unceasingly with weariness, that mortal enemy of the clearer of the bush. Still, if he keeps up his courage, the settler will always contend energetically and successfully against these impediments, and his efforts will soon be crowned with success. When spring arrives, fire will come to his aid, consuming the remains and fragments of the battle, and, before long, a rich harvest will conceal the ragged stumps, and cast the veil of oblivion over the struggles of the weary warrior.

*The first year*, the settler should sow wheat and barley, with plenty of clover and timothy. Potatoes, too, I suppose, and for the winter-keep of his cows—the bush will serve them in summer—he will plant a piece in corn and turnips. I have often heard these crops talked about on the old farms ; there, they must be manured, ploughed, hoed, &c. ; but the settler need not take such trouble ; let him sow broadcast, like other seed :  $\frac{1}{4}$  bushel of corn, and  $\frac{1}{2}$  lb. of turnip-seed to the arpent, and nothing more is required except plenty of harrowing, and a full trust in the blessing of Providence.

In this way, I have, myself, harvested 25 tons of fodder corn and 500 bushels of turnips to the arpent, and I am not the only successful one.

The settler buys mill is perhaps 60 bark, and under the covering of slate.

He will also square a few logs with dried moss and bark, and then he builds.

*The second year* sown with oats and wheat in the previous several years, and a new piece prepared timothy, and another harvest, the manure of bark, must be spread the previous year on meadows. He should first season he sows running on the same retain the fertility of

*The third year*, sions ; friends and meadows are superior chaff cutter he will and straw that new is master of his farm breakers too frequent. He must always be and his conduct must avoid losing the fruit

The settler, too, work and of extracting for the old establishments erection of cheeseries desire to encourage the country the most vigorous

By means of da riches of the soil. He serve the fertility of hearth ; he will quick

The settler builds himself a cabin and a barn of round logs ; the saw-mill is perhaps 60 miles off, so he covers his cabin in with birch and spruce-bark, and under this humble roof he sleeps as securely as under a costly covering of slate.

He will also want a small silo for his corn ; and, for this, he will square a few logs and lay them one over another, stuffing the interstices with dried moss and tempered clay. This he will again cover in with bark, and then he is, as well "fixed" as if he had a full set of farm-buildings.

*The second year*, the pieces that bore potatoes, corn, and turnips will be sown with oats and grass seeds. The fields in which he grew barley and wheat in the previous year will provide him with capital meadows for several years, and with good pastures afterwards. He will also have a new piece prepared for wheat and barley, sown down with clover and timothy, and another for potatoes, corn and turnips. Immediately after harvest, the manure, which he has put under the shelter of a rough shed of bark, must be spread on the oat-stubble, that is, on the piece which in the previous year bore potatoes, corn, and turnips, thereby securing good meadows. He should, if possible, sow clover and timothy, at once, in the first season he sows grain. If he is compelled to sow grain two years running on the same piece, he should manure it, as I said, in order to retain the fertility of the soil.

*The third year*, the clearing will have attained to pretty large dimensions ; friends and relations will come and start alongside of him ; his meadows are superb ; he must enlarge his barns, make fences, &c. ; a chaff cutter he will find very handy, considering the immense bulk of hay and straw that new land yields ; his stock has increased ; now, at last, he is master of his farm. But, stay : here he will find breakers ahead ; breakers too frequently most destructive to the prosperity of the settler. He must always be on his guard against too great a leaning to speculation, and his conduct must be regulated by the strictest economy, if he would avoid losing the fruits of his arduous labour.

The settler, too, requires means of disposing of the produce of his work and of extracting from his farm all the profit possible. For him, as for the old established farmer, dairying is the sole plank of safety, and the erection of cheeseries, in newly established parishes, is a necessity, if we desire to encourage the young to take up new land and to preserve for our country the most vigorous of its population.

By means of dairying, the settler will avail himself of the virgin riches of the soil. He will learn how to create meadows and how to preserve the fertility of his farm. Ease and plenty will soon be guests at his hearth ; he will quickly find means to supplant his poor log-hut by the pretty

cottage of our long settled districts, and while the future is growing for him less and less gloomy, he will see, with pardonable pride, his sons growing up around him, promising to imitate his example and to follow in his footsteps.

But at this point; another obstacle erects itself in the path of the settler: where is the capital for building the cheesery to come from? The system of associations has been suggested, but, even by that means, it is difficult, if not impossible, to find among these poor settlers the seven or eight hundred dollars required for the erection of a factory.

Why does not your association, Mr. President, already the source whence has flowed so many benefits, why should it not take steps to assist these settlers? Why should it not ask the government, so well disposed as it is where the settler is concerned, to make it a certain grant that will enable it to encourage the erection of *cheeseries in the new cantons*? What immense riches, what fortunes shall we not find in these fields newly won from the forest! Would not this, gentlemen, be a potent means of encouraging *colonisation*?

On you, the whole province is to-day turning its eyes. The settler, abandoned in the depths of the forest, is looking to Providence for its protection. Do you now, as formerly, show yourselves the instrument of Providence. By encouraging in every possible way the work of colonisation, you will have deserved well of your native land, and you will thereby ensure to yourself the gratitude of every Canadian that is a true lover of his country.

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#### REMARKS OF M. L'ABBE MONTMINY ON THE LECTURE OF M. CARON.

*M. l'Abbé Montminy.*—I beg to draw the special attention of the members of the association to the very important lecture that young M. Caron has just given us, in which he pointed out to us the necessity of encouraging agriculture in the new districts; especially among the settlers, and showed us how our association may attain that end.

When I visited the parish in which M. Caron lives, I had an opportunity of delivering a lecture for the encouragement of the noble efforts of the farmers of the place.

I inspected the establishment of this young man, who is yet, I may say, at the commencement of his career as a farmer. The progressive improvement that is discernible in every part of his occupation proves that he has a practical knowledge of these points that he has treated in his

lecture. The fact after leaving coll true patriotic feeli is not afraid of wo brushwood He is worthily assisted i her powers, and b happy life.

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In this distric example he has set parishes people wh M. Caron has made are worthy of all p his steps: they nee

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*M. Bourbeau.*—silos would bring in is no longer any dou several lectures on construct the botton sary to keep out the

*M. Caron.*—The do. My silo is of w I used moss for caul is of beaten earth, as as I had too far to fe filling in the silage,



lecture. The fact of his having buried himself in the bush, immediately after leaving college, shows that M. Caron has a genuine love of work, true patriotic feeling, and an exemplary love of his province. He, clearly, is not afraid of work, or of dirtying his hands in burning the *abatis*, or brushwood. He is farming the land he has cleared with success, and is worthily assisted in his work by his wife, who seconds his efforts with all her powers, and by his children, in company with whom he is passing a happy life.

M. Caron's barn is large and well built. In it is a boiler, used to heat water for the purpose of dampening and fermenting his cattle-fodder, by which treatment he saves a great expenditure in food.

In this district, M. Caron is not the only progressive farmer; the example he has set has been freely followed; and I found in these new parishes people who were in advance of their age. The noble efforts that M. Caron has made to promote the interests of agriculture in his district are worthy of all praise, and not less praiseworthy are those who follow in his steps: they need not be ashamed to call themselves farmers. (Applause).

*M. Montminy.*—According to the custom of our former meetings, I hope there will be discussions on each of the subjects treated by the lecturers.

*Mr. Ed. A. Barnard.*—The time devoted to the discussions must be brief, that we may first of all hear the lectures, or else we shall get into trouble.

*M. Montminy.*—I will return the reproach by saying that we are afraid of discussing them.

I invite those who have objections to raise to do so at once; M. Caron is capable of replying, and I hope every one will give his opinion without fear or restraint. It may perhaps cause a little excitement, a trifle of anger; but there is no harm in getting a little hot over the matter with the thermometer where it is to-day. (—11° F. Trans.)

*M. Bourbeau.*—In his address, M. Caron spoke of the profits that the silos would bring into the new districts. Their utility is established; there is no longer any doubt about them, if they are well built. I have listened to several lectures on the subject, but I cannot make out how we should construct the bottom of the silo. Some say that clay is absolutely necessary to keep out the air, will M. Caron please tell us how he made his?

*M. Caron.*—The method is very simple; I did as the books tell us to do. My silo is of wood, the foundations of cedar, and the rest of spruce. I used moss for caulking, and filled the interstices with clay. The bottom is of beaten earth, as in ordinary cellars; I did not use clay for the bottom, as I had too far to fetch it. A layer of old hay I put at the bottom, before filling in the silage, and the stuff kept well.

*The President.*—It is essential that no air can enter.

*Mr. Barnard.*—Would not putting *bad* hay at the bottom of the silo have the effect of retaining air which might possibly spoil the silage?

*M. Caron.*—The hay I put was *old* hay, but good, and the silage kept well.

*M. Chapais.*—M. Caron spoke of his crops of turnips, rounds and tankards, and of his successful cultivation of these roots. It would be interesting to know how he obtained such good yields.

*M. Caron.*—The means followed were as simple as the building of my silo: in spring, after seed-time, I burned a fresh piece of brushwood, and sowed it with turnips at the rate of  $\frac{1}{2}$  to  $\frac{3}{4}$  lb. an arpent. I sowed broadcast, taking care not to put too much seed; and I harrowed strenuously.

*M. Marsan.*—M. Caron has just been talking of the encouragement that the settlers should receive, and of the way in which the Dairymen's Association should proceed to arrive at this end. As our resources are rather limited, and as we are not the government, we can only set before people the example of success, by diffusing a knowledge of the good results obtained by those who, like M. Caron, follow the right road, and by inviting farmers to follow in their footsteps; this would be a practical way, and the least costly to the country. M. Caron struck off in the right direction, and success has crowned his efforts; but many settlers are just where he was at starting, except of course that they are not so well educated.

Allow me to cite another encouraging example. I, myself, know a settler in the canton of Westford, M. Luc Charrette by name, who sold last season 2,000 lbs. of butter at 20 cents a pound. He is making butter all this winter, which he expects to sell as high, or even higher, thanks to his system of feeding his cows on silage. And more than that; as he is a long way from the main roads, M. Charrette has ordered a car-load of bran, that he may have food fit for the production of the greatest possible quantity of milk. He intends to make many hundred pounds of butter more than the other farmers.

He grows a great deal of fodder; he makes ensilage; he milks his cows carefully, and although his farm is relatively small (100 acres), he lives well and is better off than many settlers who have much more land.

To bring to the knowledge of our farmers the success attained by such intelligent and industrious settlers as these, is the best means of diffusing agricultural instruction. With such examples before them, they cannot fail to profit by them. If the government cannot assist the new factories, or itself build cheeseries or creameries, the settler can, as M. Charrette does, make his butter at home. (Applause.)

*The President.*

*M. Marsan.*—I add that he is not in the sense, and those who have soon began to grow oats for the

*M. Montminy.*—How many head of

*M. Caron.*—I was but that was not enough there are still plenty much as 25 tons of

*M. Chapais.*—D

*M. Caron.*—My

## SUPPLEMEN

*Note.*—All the contributions; time, unforgotten to the meeting.

The board of directors has read the interesting essays in the annual report that they could not

REPORT OF M. M. TH

MONSIEUR SAUL CO

*Inspector general*

SIR,

I beg to acknowledge which was transmitted to you request me to refer to my report as inspected respectfully to observe the men's Association of only obliged to send it after having discharged think I was then bound

*The President.*—Has this farmer been long on his land ?

*M. Marsan.*—Yes ; he was quite young when he went there ; I may add that he is not the only one who has distinguished himself by his good sense, and those who, following his example, have been breeding stock, have soon began to thrive ; while those, who have devoted themselves to growing oats for the *chantiers*, have remained in the rear.

*M. Montminy.*—Was your farm well cleared when you took to it ? How many head of cattle have you now ?

*M. Caron.*—I winter 25 head at home. My farm was partially cleared but that was not enough to frighten one, for there were lots of stumps, and there are still plenty of rocks. The soil is very fertile : I have grown as much as 25 tons of turnips to the arpent. (1,300 *bushels to the acre!* Trans.)

*M. Chapais.*—Does not corn freeze there ?

*M. Caron.*—My farm is on a mountain, so it does not suffer from frost.

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#### SUPPLEMENT TO THE REPORT OF THE CONVENTION.

*Note.*—All the essays that follow were to have been read at the convention ; time, unfortunately, failed to allow of their being presented *vivâ voce* to the meeting.

The board of directors, like last year, decided to publish these interesting essays in the annual report, with this preface, stating how it happened that they could not be read at the Montmagny convention.

#### REPORT OF M. M. A. PICHE, INSPECTOR OF THE SYNDICATE OF THE DIVISION OF ST. HYACINTHE.

MONSIEUR SAUL COTÉ,

*Inspector general, Quebec.*

SIR,

I beg to acknowledge the receipt of your letter of 11th December last, which was transmitted to me through M. J. M. Archambault, in which you request me to remember that I am behindhand with the sending in of my report as inspector for the division of St. Hyacinthe. I beg you respectfully to observe, Sir, that according to the regulations of the Dairy-men's Association of the province of Quebec, the inspector of a syndicate is only obliged to send in a weekly report during the exercise of his functions. After having discharged this duty in its proper time and place, I did not think I was then bound to make a supplementary report.

As the order you send me is imperative, I respectfully submit to you the above fact, but simply as an observation, by no means for the purpose of avoiding complying with the order; and, on the other hand, as other reasons than this might be imputed to me, were I to put it off any longer, I will proceed to the discharge of this function with all the more pleasure that I did not think I had to do it.

Last April, I received from Monsieur J. de L. Taché, secretary of the Dairymen's Association of the Province, instructions to work at the formation of a syndicate of cheese-factories in the county of St. Hyacinthe. The instructions limited me to the factories of the county. Through either apathy or indifference, the project at first fell through; but later, the co-operation of some of the factories of the counties of Verchères, Rouville, and Shefford gave us a sufficient number of factories, and at the beginning of June, the first syndicate of the county was organised.

St. Hyacinthe is, I believe, one of the oldest cheese-making districts of the province. Having enjoyed for more than ten years the privilege of having a dairy-school in the very heart of its district, it might very easily be supposed to be also the most advanced of the province, both as regards the excellent general installation of its factories, and the superior quality of its products. But it would seem that the people have not responded favourably to the efforts made on their behalf by the Dairymen's Association and the government; since, out of 22 factories, of which my syndicate is composed, 3 only can be called first-class, 6 second-class, and the rest third- and fourth-class.

At my first visit, in the first week of June, I could tell what sort of cheese had been made up to that time. Everywhere, with but few exceptions, it was inferior; few makers realised the highest market-price; on the contrary, many of them suffered losses relatively great.

How could it be otherwise? In addition to the inferior installations I mentioned, must be noted the inexperience of many makers, the negligence, not to say the filthiness, of a still greater number; for, indeed, cleanliness does not seem to be the reigning virtue among the generality. At this time, too, the instruments, in many cases, were wanting in accuracy. You may judge of this by only one case—the thermometer; only 5 of these were correct in indications; all the others varied from 2° to 5°, either plus or minus; there was one that was erroneous by 7°!

But these are not the sole reasons which had contributed and will continue to contribute to the making of inferior qualities of cheese; the patrons are also guilty in no small degree; yet, if there ever was a time when a patron, who is in earnest and a good man of business, should devote particular attention to the care of his milk, it is surely at that period when the cows go for the first time to grass, and when they are about to

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pass through the critical ordeal of calving. Yet, how many patrons do not seem to trouble themselves about these points, but continue treating their milk as usual, while by far the greater number devote no care at all to it, but look upon their milk as "a thing of naught." In fact, and in consequence of minute observation, I am convinced that at most 5% of the patrons cooled their milk, and they only their evening-milk; as for the morning-milk, that need not be mentioned in this category. Straining, must be considered quite an exception. With such materials to work upon, how can the makers be expected to furnish unexceptionable goods for exportation?

On the other hand, many makers are ignorant of the proper way of testing milk, or were not supplied with the proper test-instruments, and under the protection of impunity, it was impossible that frauds should not increase. At the very beginning, I distributed among the patrons of each factory a sufficient number of bulletins, containing information concerning the proper way of treating milk, and the state of the laws relative to the repression of fraud. It seems there was some improvement. Still, all the robbers were not smitten by fear; patrons, any more than other people, are not ruled by fear alone: and the trifling repayment of \$43.00, by certain patrons, proves the truth of this axiom. Others found it more prudent to amend their ways at the first notice. Although cases of fraud were comparatively rare, I must put them down at 2%, while the cases of want of care, causing the milk to be really inferior, amounted to at least 6% of the number of patrons. These figures show the necessity of henceforth paying the patron for his milk in accordance with its real value, and not, as is generally done, according to its quantity.

I think, too, that more attention ought to be paid to the quality of the materials that enter into the composition of cheese, particularly of the extract of rennet. That *extract* is generally regarded as the best which, in a given time, can coagulate the largest quantity of milk, without regard to the quality of the cheese made from it. Now, talking of this, here is what, in two instances, happened to me this year; two makers failed to succeed in their task, in spite of all their efforts, and all previous to receiving my instruction. At last, I advised them to change the rennet, and, the very next day, without any other apparent cause, the difficulty had vanished. In my capacity as a maker, I had once before met with the same trouble; and had combated it elsewhere by the same means; the extract they had been using was also the same as the one that failed me.

Lastly, Mr. Inspector, in every direction, along the whole line, I find improvement. The quality of the cheese, from *middling*, has become at least *good*; a larger number of the patrons take care of their milk; fraud has been decidedly checked; some proprietors are repairing their factories with a view to insuring a better place for their manufacture next season;

the working of the syndicate has undeniably had the effect of creating a current of activity and emulation, which cannot fail to redound to the profit of those who devote themselves to dairying in this district. Still, I owe it to truth to say that all this goes on but slowly, and before full success can be attained, and the object of the association be thoroughly secured, apathy must be converted into energy, and innumerable prejudices must be overcome.

I doubt not but that we shall succeed in this, for an industry that, in this small district, during one season only, has proved itself capable of turning out more than a hundred and ten thousand dollars' worth of export goods, assuredly merits the consecration to its advancement of earnest and persevering solicitude.

The whole respectfully submitted,

(Signed), M. A. PICHÉ,

Inspector.

St. Pie, January 22nd, 1892.

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A LETTER FROM M. J. LOUIS LEMIRE.

J. de L. TACHÉ, Esq.,

Secretary D. A., P. Q.

Mr. Secretary,

Not being able to be present at the meeting of the Association at Montmagny, in spite of all the pleasure I should have enjoyed and the advantages I should have derived from it, I beg to give you in a few words my opinion of the *Syndicates of cheese-factories*. As secretary of the syndicate of the division No. 5, and as seller for many factories, I can testify to the good done by our syndicate in the counties of Nicolet and Yamaska. The proprietors have improved their buildings and their instruments; the makers, superintended and taught by the inspector, have done their duty better; the patrons, knowing that their milk would be inspected from time to time by one unconnected with the district, look after its preservation more carefully, and some, even after its purity; and the sellers, having better goods to deal with, sell them for the highest market price.

I have an idea about inspection. How would it be if, in our rural parts, thoroughly practical *agronomes* were commissioned to visit our farmers, to discuss with them their style of farming, to teach them to treat their animals and manures properly, showing them how to divide their land into fields, how to arrange their cowhouses, &c.; in a word, to suggest

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ON THE OPERATIONS

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to them plans of good farming fitted to their individual needs and means? This, I think, would be an excellent way of promptly realising a great step in advance; and for my part, I should have not the slightest objection to sacrifice our agricultural societies in view of this object. For, it must be confessed, these associations in general have never done good in proportion to their cost. The Dairymen's Association, which has only been ten years in existence, has done more good to agriculture (I do not hesitate to say) than all these societies since their origin, which dates pretty far back. If you think this idea of mine worthy of consideration, you might impart it to those devoted friends of the farmer who usually are present at the conventions. I do not seek to raise a discussion on the subject, for I am aware that the time of the convention will be so fully taken up by the programme that any fresh subject of discussion would cause a loss of precious time; but if it were once mentioned to the convention, this project might soon arrive at a practical solution, to the greatest benefit of agriculture, which I should like to see take quicker steps, in this province, along the path of progress.

Your very obedient servant,

J. LOUIS LEMIRE.

#### REPORT OF M. J. AD. CARON,

ON THE OPERATIONS OF THE SYNDICATE OF DIVISION No. 4, OF THE COUNTIES OF MEGANTIC AND ARTHABASKA.

This syndicate, formed March 30th, 1891, comprises 28 factories in the counties of Megantic and Arthabaska.

The inspector, M. L. O. Drouin, of Plessisville, appointed by order in council, 15th May, 1891, began his visits on the first of June following, and paid 112 in the course of the season.

The directors of the syndicate, 5 in number, held meetings every month in different places, at which the patrons were called together, and the interests of dairying and the progress of the making of cheese were discussed.

The inspector tested 3,295 samples of milk. All cases of adulteration, fraudulent or otherwise, were settled amicably. These numerous tests have been productive of excellent results, and a marked improvement has been visible in the quality of the milk delivered at the factories.

	lbs.
The quantity of milk received at the different factories was about.....	11,000,000
The quantity of cheese made was.....	1,103,200
Showing an average yield of about ten % or strictly speaking, a pound of cheese from 9.97 lbs of milk.	
The sales produced.....	\$88,356.00
Making the average price of the cheese.....	0.08

In 1890, the makers or proprietors of the factories were obliged to pay back to the purchasers, \$1,200, on account of losses and of deterioration in the quality of the cheese. In 1891, these defects only cost them \$200, the greater part of which sum may be assigned to the make of the month of June, the first month in which the syndicates went to work.

We foresee the necessity of forming two syndicates in the district for 1892, on account of the number of factories already syndicated, and the number seeking syndication. We hope to have a trade-mark to stamp the cheese that comes from the syndicated factories.

J. AD. CARON.

### THE ADULTERATIONS OF MILK BEFORE THE CANADIAN COURTS.

Our readers will have remarked at page — of this report, “An Act to provide against frauds in the supplying of milk to cheese, butter, and condensed milk manufacturers.” (52 Vict., cap. 43, Ottawa.)

This act has served as the ground for a prosecution by a maker of the county of Yamaska against one of his patrons, whom he accused of having dealt fraudulently with his milk.

As, sad to say, the inspectors of syndicates still too often meet with like cases, we publish for their information as well as for the information of our members, the documents in the suit of “Biron vs. Charland” and the judgment that concluded it.

DISTRICT OF RICHELIEU, }  
Magistrates Court. } No. 2355.

NOTES OF THE MAGISTRATE IN GIVING JUDGMENT ON THE CAUSE.

ADRIEN BIRON,

vs.

ALBERT CHARLAND.

When I was hearing this cause, I thought fit to call it a very important one, especially as regards the decision I must render, for both parties to the suit are very deeply interested, though in very different ways, in the result :

On one hand, if I convict the accused, I must be perfectly satisfied that this man, of deliberate purpose and in order to defraud, put water

into his milk : the Association in the pay for water in which, whatever and honour of the

(On the other hand, the defendant is convinced that possible proof of it since the courts procure for the fraud the association say make that, which a honest manufacturer

This, then, is a part of the province great discretion and I may give to the association the full benefit of a

The action was for having on the 2<sup>d</sup> and brought to be adulterated, in virtue of the Statutes of Quebec, and of cap. these two Statutes a purpose of punishing in this trifling variation a fine of not less than

The defendant

First, that the purpose of the incorporated Association is to govern the Statutes that govern nothing more than o

It has been asserted that the article 5,716 shows that the Statute is certainly not in a c

Besides, the two parties interested

It has been said that the Association is a Justice of the Peace



into his milk: that in thus cheating, he was ruining the credit of the Association in the manufacture of its cheese, and to sum up, he was getting pay for water in pretty large quantities; and this is a criminal offence, which, whatever may be the justice of my decision, will expose the name and honour of the man to many comments.

On the other hand, were I to dismiss this action, and were the Association convinced that it had made, and succeeded in making, the best possible proof of its cause; thenceforth many patrons would do what the defendant has done; fraud would destroy the reputation of this industry, since the courts would seem unable to repress these frauds, which procure for the fraudulent ones money in exchange for water: Well, will the association say, let us give up this manufacture, if the courts cannot make that, which alone can cause our prosperity, to be respected: "the honest manufacture of good cheese."

This, then, is a decision of importance both for the country and for that part of the province whence the cause derives; and I need the co-operation of great discretion and of extreme prudence in interpreting the evidence, that I may give to the association all the protection it claims, and to the accused the full benefit of any reasonable doubt, if any such there be.

The action was brought on November the 21st against the defendant for having on the 27th of August last, "knowingly, fraudulently supplied, and brought to be converted into cheese, milk mixed with water and thus adulterated, in virtue of art. 5484 of the Revised Statute of the province of Quebec, and of cap. 43, sect. 7 of the Dominion Statute. The provisions of these two Statutes agree perfectly as to the manner of proceeding for the purpose of punishing those who are guilty of this offence; except, perhaps, in this trifling variation in the sentence, which according to one Statute is a fine of not less than \$5, and of not less than \$1 according to the other.

The defendant puts forth several pleas:

First, that the present action ought to have been taken in the name of the incorporated Association: I see nothing of the sort in either of the two Statutes that govern this action, which is simply summary, and requires nothing more than ordinary summary actions require.

It has been asserted that an action *qui tam* ought to have been taken: the article 5,716 shows us how and when a *qui tam* may be entered, and it is certainly not in a case like this.

Besides, the two Statutes prescribe that the action shall be brought by the party interested or by one of them.

It has been said that the jurisdiction in this cause only belongs to the Justice of the Peace where the offence was committed: as my jurisdiction

extends over the whole district, and as my appointment was only made to serve in case of there being no other justices of the peace in the parishes of the district (*que pour obéir au défaut*), there is no doubt that my jurisdiction fulfils the idea of the legislator and of the law :

The payment of the fine to the president or to any other persons, cannot mean that the action is to be brought in the name of the association.

As to the proof to be in writing or otherwise, if there be an appeal, the Statute provides that the proof may be made before a judge of the Superior Court, to which the appeal is carried.

In a cause of Pierre Paul, game-keeper of this district, vs. Beauchemin, Judge Gill decided that, in causes decided in virtue of summary convictions, the evidence is not to be taken in writing, unless on the demand of the parties, or when a special statute so orders it.

The evidence in this cause is ruled by the Dominion Statute of 1889: The principal witness, William Parent, who is one of the ordinary inspectors of the cheese-factory of St. Thomas de Pierreville, and of several others in the district, says in his testimony :

" I remember my visit of August 27th. about 6 A. M. As fast as a can was received, the maker poured it into the large can, and having taken a sample, he put the corresponding number against the patron's number. That morning, I inspected the milk of all those who brought any : number 38 was gummed on the glass and I tested it; I warmed it up to 70°; the usual degree shown by milk at that temperature is 98, and generally for good milk 95 to 100; 93, even, is pretty good milk, and I have never had less out of the 3,555 tests that I have made.

The test of August 27th of No. 38, belonging to the defendant, gave me 84; I have never seen anything like it; I conclude there must have been 14 or 15 % of water in that milk; I am positive that there was water in it; I asked the maker whose milk it was; he replied, "M. Charland's." I told him that there was water in the milk; "There is water enough to frighten one."

The witness, Saül Côté, who enjoys a great reputation as Inspector-general of this *great industry*, which now comprises, in the province, nearly 800 factories, corroborated the testimony of Parent as to his experimental tests, the results obtained, and the universal application of the *lactometer*, in the absence of more direct evidence.

The law, indeed, accepts this instrument as *prima facie* evidence, provided always that it be used by competent and skilled men. M. Parent has many years' experience to his credit, and in this case there can be only

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(True copy),

R. PLAMONDON,  
Attorney for

his interest in the manufacture, or his pretended hatred against the defendant, which might appear to me to be dictated by any other sentiment than that of desiring that the laws ruling these manufactories be respected, and the protection they claim be afforded them.

The letter of the plaintiff to the defendant, his recognised experience, his frank and unhesitating explanations about the use of his lactometer, and the results thereby obtained, denote a certain adulteration of at least 14 to 15% of water, a thing unheard of by any one who is acquainted with the business, convince me that this evidence is strong enough to condemn the accused in the penalties of the Statute.

As to the chemical analyses that the accused invokes in these cases, of which, however, the Statute is silent, I perceive that they would give still greater certainty to the test of the lactometer; but any one can see at once the difficulty, under the circumstances, of having every morning, at the factory, a chemist attached to each cheesery, or even to several at once.

Lastly, the defendant himself, capable according to the Statute, of testifying in his own behalf, declares, as might be expected, that he did not put water into his milk; and it is easy to see that so it will always be; that a defendant will plead "not guilty," to an accusation that attacks his reputation and throws a cloud over his future.

I regret it, but under the circumstances, I am convinced: that the prosecution has been taken as the law directs; that the evidence has been the best possible under the circumstances; and that the accused is subject to the penalties the Statute imposes on him.

I condemn the accused to a fine of \$1 and costs, or to 12 days imprisonment, and, in default, within 8 days, of payment of the amount, in accordance with the forms imposed by the Statute, to 12 days' imprisonment.

(Signed) CHARLES DORION,  
District Magistrate.

(True copy),

R. PLAMONDON,  
Attorney for the Prosecution.

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BILL OF COSTS of the prosecutor, the amount of which was added to the conviction and sentence pronounced against the defendant in this cause, December 16th, 1891.

	\$	cts.	\$	cts.
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Certified correct, in conformity with the tariff of costs.

AL. D. DE GRANPRÉ,  
Dep. Clerk of the Peace.

Sorel, December 16th 1891.

MEMORANDUM.—NOTE :

*Defence :*

Prosecutor,	2 subpœnas and 8 copies.....	\$	1 20
	Notice and 8 copies.....		2 50
	Notice and 8 copies.....		2 10
	Counsel.....		
Defendant.	Taxing witnesses for the defence.....		39 00
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			\$ 44 80

## APPEAL :

Petition 238 .....	\$ 1 00
Exhibit 238.....	0 50
2 Orders 238.....	0 80
Notice " .....	6 60
Signification of notice.....	0 25
Signification of notice.....	0 60
Appellant's Counsel.....	20 00
Respondent's Counsel.....	12 00
Hon. <i>sur mémoire</i> .....	2 00
Jury's copy.....	0 70
Bill.....	0 60
Execution—Bailiff.....	0 50
Costs of appeal.....	8 00
Costs of prosecutor, first trial.....	97 60
Costs of defendant, first trial.....	44 80
Total costs.....	\$195 95

## REPORT OF M. E. MACCARTHY.

DIRECTOR OF THE PRACTICAL DAIRY-SCHOOL OF THE PROVINCE OF QUEBEC,  
TO THE BOARD OF DIRECTORS OF THE DAIRYMEN'S ASSOCIATION,  
ON HIS MISSION TO EUROPE.

Nantes, (France) January 10th 1892.

*To the members of the Board of Directors of the Dairymen's Association  
of the Province of Quebec.*

Gentlemen,

On the 25th of last July, after an interview with your President, M. Bernatchez, I had the honour to address the following letter to him :

MONSIEUR N. BERNATCHEZ,  
President of the Dairymen's Association  
of the Province of Quebec.

MR. PRESIDENT,

In conformity with the instructions I received in April, I have the honour to inform you that, on the 1st of last May, I took possession of the Practical Dairy-School which your association had determined to establish at St. Hugues, and which was entrusted to my superintendence.

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During the month of May, I had 20 pupils, one after the other, all of whom being engaged in different factories in the Province could only pass a limited time with me, as they were shortly obliged to join the factories at which they were hired.

After June 1st, I had no one there except the staff attached to the Factory-School, and a staff composed of men who, I am bound to say, are perfectly well instructed in their business.

The school is now entirely without pupils, and I believe will remain so up to the end of the season.

The situation in which this want of pupils places me, for without them I have nothing to do, decides me to leave the school and go to Europe, there to make a tour for the purpose of pursuing my investigation into matters concerning the dairy-industry.

I have laid down the following plan ; it is in agreement with that I had the honour to submit *vivâ voce* to you to-day, and which you were good enough to receive favourably.

I have often remarked with profound conviction, and events, particularly the report of M. Auguste Dupuis on the Jamaica Exhibition, have proved me to be right : *That, in the Province of Quebec, there are two principal industries to be created : That of butter packing in boxes, and the manufacture of condensed milk.* These two industries must one day offer a considerable market to dairy-products. As to the rest of the subject, I would refer you to what was said at Sorel, when the Convention was being held there last November.

I intend, then, to leave at once for Europe, there to study, in all their details, the preparation of butter for inter-tropical countries, the packing of this butter, the Swiss method of making condensed milk, and, especially, to establish with European merchants, who have branches of their firms in the Colonies, such commercial relations as shall afford markets for these products.

I feel satisfied that, through my numerous connections, I shall succeed in obtaining these different results, and in handing them over with scrupulous accuracy to the association, that it may turn them to the account of the inhabitants of the Province, who would find their benefit therein.

I must remind you, Mr. President, that my engagement with the association does not expire till the 1st of next December. There are still four full months to that date. If I remain at the school, the result will be absolutely *nil*, as there seems no chance of any more pupils, and from now to that date, the sum then due to me as salary will be thrown away.

I therefore offer to the association to leave for Europe at once, with the above named design. I demand no sacrifice from it in return, limiting myself purely and simply to a continuance of its engagements with me up to the first of December next : I ask nothing more.

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I trust, Mr. President, that the interest my proposal deserves to excite, and the benefits it offers to the province, will strike you as being sufficient to authorise you to give me a satisfactory reply.

In brief, I make this offer :

1. To go to Europe, *at my own expense*, to study the questions above mentioned ;
2. To collect all things necessary to the creation and good working of the important branches of packed butter and condensed milk.
3. To establish commercial relations, for the marketing and disposal of these products, between Canada and firms that have branch-houses in the colonies.
4. To keep myself, during my tour, in constant communication with the association, and to make an anticipatory report for the next convention ;
5. To make to the association, after my tour, a circumstantial report containing the result of my inquiries concerning the two industries, and thus to enable the public to establish them in this country.

Awaiting a prompt reply from your kindness, pray accept Mr President, the expression of my most distinguished sentiments.

(Signed.)

E. MACCARTHY,

Director of the Practical Dairy-School.

In accordance with the request of M. Bernatchez, this letter and the proposal it contained, were sent to each of you, in the following terms, by M. J. de L. Taché, the Secretary of the Association :

Quebec, July 25th, 1891.

Sir,

You are respectfully requested to take cognisance of the following letter that Mr. E. MacCarthy has just handed personally to our president. The proposal therein submitted is important, and the president wishes to have the opinion of the Board of Directors as to what ought to be done about it.

Therefore, you will kindly let me know your opinion by next mail, if possible.

I have the honor to be, Sir,

Your very obedient servant,

(Signed.)

J. de L. TACHÉ, Sec. D.A.

In his letter, of the 5th of last August, addressed to M. J. de L. Taché, of which the latter was good enough to notify me on the 7th of the same month, M. Bernatchez informed him, that on account of the replies made

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by the members of the board of directors to my proposal, he had no choice but to accept it, with this condition: that one-half of the sum asked by me as the continuance of my salary, as Director of the School, up to December 1st, should be paid to me monthly, and that the association should only pay me the other half when I had made to the board of directors my report on the mission which I proposed to complete.

As this restrictive clause was incompatible with my sentiments of honour and with my proper pride, I had a verbal explanation with M. Bernatchez; in the course of which he declared that, in this clause there was no injurious intention of casting suspicion on my character, and it was only inserted with a view to comply with a usage generally established in Canada. In the face of so loyally expressed a declaration, I agreed to go on my way, and a few days afterward I left for Europe.

On my arrival in France, I had to lie up for more than two months, on account of a wound I received in a storm during my voyage.

Early in November, I started on a tour of industrial investigation, and I have just returned, after having travelled nearly 1,500 leagues, and having studied on the spot several kinds of industries, especially interesting to the province of Quebec, in important establishments, which were thrown open to me in the most obliging manner.

I shall only speak here of the industries connected with the dairy, as I intend to reserve to myself the transference to Canada, at some future time, of the fruit of my investigations into the manufactories of other products, and to derive as much profit as possible from them by endowing your country with a novel industry.

In the report that follows, *and which is that I promised you in my letter of the 25th of last July*, I shall follow the programme laid down by me in that letter, thus fulfilling, in all its thoroughness, the engagement I voluntarily entered into with you. I will add that, faithful to article 4 of that engagement, I have kept myself constantly in communication with the Secretary of the Association, M. Taché, and that I have acquainted him with all my proceedings, in some sort from stage to stage.

#### BUTTER PRESERVED FOR THE COLONIES.

The first part of my programme concerns the preparation of butter, and its packing in tin-boxes for export to intertropical countries that produce no milk.

In his noteworthy report on the Jamaica exhibition, M. Auguste Dupuis mentioned particularly this product in the following terms, which clearly show all the importance that it deserves should be attributed to it by the province of Quebec:

"The butter that was most in favour, before the arrival of the Canadian butter, was the Danish and the Dutch, imported via England. It was packed in tin boxes, containing from half a pound to five pounds, and hermetically sealed. I could not learn its cost price at Jamaica, but in retail at Kingston, it fetched 55 cents a pound.

A butterman, at Kingston, told me that butter packed in this way must be of the first quality; adding, that a company at Cincinnati, Ohio, had begun to send to Jamaica butter in tin boxes, but that it was so little uniform, such a mixture of good and bad, that the company had completely lost the Kingston trade.

At Hayti, they prefer French and Danish butter: the air does not injure it when packed in these little boxes, and the retailers do not lose in weight: while tub-butter loses in weight and in quality, through the effects of the air and the extreme heat.

Mr. Fisher, who came to Jamaica from the Honduras, found the l'Assomption butter excellent, and told us that such butter as that would sell well at the Honduras and over the whole of Central America. Unfortunately I had not a sample of keeping butter to give him.

"On the 26th of October last, I wrote to Mr. MacCarthy on this subject, and to my request that he would prepare some butter, like the butter exported from France to Algeria, that I could send to Jamaica, I received a reply, the most important passage of which I will quote. After having expressed his regret at not having any such butter to send me, he continued:

"No butter having, as far as I know, been made in Canada especially for the colonies, it may not be without utility to tell you in what points the preparation of such butter differs from that of ordinary butter. Besides, it must be packed in metal boxes, hermetically sealed, as in the case of "canned goods." Butter sent to the colonies in common packages will not prove satisfactory.

"Not only would a sample of butter packed in tubs fail of attaining the desired object, but it would do more harm than good, and defeat the success of our future exports to the colonies. There is a grand industry to be created here, but it must be well understood that the Danish and French butters which are sent to the colonies are prepared in a way unknown here, and unless this plan is practised, success is impossible.

"The advice of Mr. MacCarthy must not be neglected, for it deserves serious attention.

In France, as in Denmark, the preparation of "preserved" butter has long occupied an important position, which becomes more and more important as new markets are opened by the system of colonial political economy followed at present by most European governments. Still, I must say, here, that the butter made in *all* the districts of the two countries I

have just mentioned depends, partly on the passage across the water, to find a purchaser in mind, though it first proceeds to the well, for export hand, what kind of arrival in these parts, think of it. We have in the colonies, and purchasers cons

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have just mentioned is not fit for exportation, even when well made; this depends, partly at least, on its chemical composition; some butter in its passage across the line turns to oil, and, in such a condition as that, cannot find a purchaser. This is a very serious defect, and must be borne in mind, though it can only be proved by experience. Therefore, I shall at first proceed to hire workmen to make samples of butter, and pack them well, for exportation to Brazil, India, &c, in order to ascertain, on the one hand, what kind of condition and consistence this butter retains on its arrival in these countries, and on the other, what the purchasers there think of it. We must not forget that the trade-mark has great influence in the colonies, especially on the greater or less eagerness with which the purchasers consume a product from this or that country.

On my return to Canada, which will probably be about the beginning of the butter-making season, I shall be commissioned, by several firms having colonial branch-houses, to send to the latter samples of preserved butter, on which to found a settled opinion. We know what butter is worth in Canada; we shall then know exactly what it will fetch in the largest consuming colonial countries.

In my opinion, it is in these alone that we must look for our markets, for the European market, more and more overloaded with butter as it is, can only prove ruinous for Canada butter, if any one is innocent enough to send any thither.

I must confirm, here, most earnestly what I said incidentally at Sorel, and warn the dairymen and others of the province of Quebec against the tricks of people who have only their personal interests in view and who, accustomed as they are to live by lying and trickery, endeavour by throwing magic powder into their eyes, to draw dupes and victims into their nets. I say, again, that, if the problem were solved—which it is not—of keeping butter perfectly fresh for a length of time, that it would be a cheat to persuade Canadians to send their butter to the European market, and that on account of the reasons I have advanced. The increase of deliveries of butter always occurring on the European market, would of course cause a constant depreciation of its selling price, unless its cost price were modified.

No, we must not deceive ourselves; the efflux of Canadian butter can only be secured by, on the one side, local consumption, and on the other, by its exportation to intertropical countries, which can only be done on condition that it be, first of all, well made, then, carefully prepared, and lastly, packed with every precaution in boxes so thoroughly hermetically sealed, that it shall be positively protected against all access of the air.

After having communicated to you this opinion, as sincere as it is disinterested, I proceed to show you the method of manufacture employed in the best French and foreign factories I had permission to visit during the course of my tour.

In general, with but rare exceptions, the factories in which butter is packed in tin-boxes, whether in France, Denmark or Holland, are not what are properly termed creameries. To collect the butter required for a "preparation-factory," each establishment employs special agents experts, to buy butter in the districts that produce it. These men are skilled in judging of the quality of what is offered them for sale; they pay what the butter is worth, and send it to their factories. When arrived there, it is tasted by other experts, who class it in divisions according to its quality.

This butter, which generally has been made by farmers who have not a perfect set of implements, still retains a good deal of buttermilk, which must be got rid of somehow or other; for the first quality of a keeping-butter (*beurre de conserve*) is to be perfectly free from buttermilk, which, by its conversion into lactic acid, would subsequently become a powerful element of decomposition.

A very perfectly constructed apparatus, which long experience has recognised as indispensable, is employed in getting rid of this buttermilk, which operation is always accompanied by a washing with pure running water. In this apparatus will, first, be found the *horizontal, rotary* kneader, the use of which is to drive out all the buttermilk, to wash the butter free from all impurities it may contain, to begin its dessication, and to impart to it, by means of a pigment, the colour that is wanted to suit the taste of the country to which it is to be exported.

In the cold season, the *kneader* finds it difficult to work up the butter, as it forms what are technically called *knots*. These must be got rid of, for which purpose a machine called a "smoother" (*lisseuse*) is employed, which flattens out the butter into very thin sheets, and makes the knots vanish.

When the manufacture has arrived at this point, the butter is not always uniformly coloured; moreover, the proper quantity of salt must be added, and the drying finished. These ends are accomplished by a *vertical* kneader, which imparts perfect homogeneity to the butter, and makes it thoroughly uniform in colour and saltness. I should mention, here, that these apparatus, acknowledged to be absolutely necessary to the preparation of good butter, are so arranged that they neither injure its grain nor give it that greasy flavour which is the fault attributed to all butter badly kneaded, or worked with defective apparatus. (1)

I spoke of the degree of saltness and of colour: the weight of salt used is invariably 7 or 8 %; the colour is more or less deep, according to the taste of the importing country. For Indo-China, it is light or pale yellow, that is, natural colour; for Brazil, orange colour, much deeper than the former.

(1) Readers will please remember that *apparatus* is singular or plural as the sense requires. A. R. J. F.

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I must add that, in the butter-preparing factories whose reputation stands highest in the colonies, I have it as an absolute fact, that an antiseptic is employed which preserves in the butter, even when no salt is employed in its confection, both as regards its aroma and its taste, that fresh flavour so much appreciated by consumers. This antiseptic is very little known, and is only used by those who have purchased the secret from the inventor, and are now making immense profits by the run their butter has on the markets, where it fetches the highest prices.

I was lucky enough to get a sample of this material, and I made an experiment with it on an absolutely fresh butter, that had not a particle of salt in it, and was, of course, thereby subject to very easy decomposition. In this experiment, I took a pound of sweet fresh butter, all from the same churning, and divided it into two equal parts, one of which, in its natural state, was packed in a tin box; the other, after having had added to it a very small quantity of the antiseptic in question, was packed in another tin-box. Both boxes having had their covers fastened on, were kept under observation, and underwent the influence of all kinds of temperature, sometimes hot, sometimes cool, according to the surrounding atmosphere in which they were during my tour and after my return. This butter was prepared and packed at the beginning of November. I have just taken it out of the receptacles, and I naturally find that the butter that was not mixed with the antiseptic tastes like rancid grease and has lost all flavour of butter, while the butter that was antisepticised is as fresh, as full of flavour, after two months of being kept in contact with the air, for the boxes were not hermetically sealed, as it was on the day in which it was packed! This result is absolutely conclusive, and shows what would be the condition of butter salted and stored in hermetically sealed tins.

After a good deal of trouble, I succeeded in securing, under weighty conditions, the property of this antiseptic in America; and, on my return to Canada, I shall put it at the disposal of the makers who desire to ensure the keeping properties of their butter.

I now proceed to describe the method of packing the butter in boxes, which is done immediately after the operations above mentioned. Tin is the material of which the boxes are invariably made; glass jars are not employed in the preserved-butter trade, as the various disasters they are subject to have caused them to be completely thrown aside. On the boxes in use, stamped directly on the tin, are the name of the maker and his factory (trade-mark) as well as the name of the country where made. The colour of the stamp varies according to the country whither it is to be sent: always *red* for Brazil, which has annexed that colour positively; and green for almost all other countries, particularly for Indo-China.

The boxes are, first of all, rinsed in boiling water, so as to sterilise them as much as possible, and then set to dry on racks. In most factories,

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the butter is packed in the tin-boxes by hand, and, with practice, this can be done pretty quickly. But I have seen a contrivance, comprising a series of special apparatus, by means of which the boxes are filled almost automatically; but this was in a very extensive factory, which, by means of these apparatus, aimed at a great economy in the labour it had to employ. In average or smallish factories, hand-packing can be used without any difficulty.

The boxes are so made that when once filled with butter, they weigh exactly as much as they are said to weigh; the sizes are:

lb.  $\frac{1}{2}$  2 3 4 5 7 14 22 28 44 lbs.

It is customary for the gross-weight to be reckoned as the net-weight; that is, if a box labeled 1 lb. weighs that weight, box included, it is sold as a pound of butter. This avoids fumbling with the butter, and numerous weighings, which take up a good deal of time when the butter is being packed, and cause a loss of profit to the factory, time being, of course, money.

The boxes being full, the butter is covered with a peculiar kind of calico, fitted to the box. The tin cover is then put on, and hermetically sealed down.

This sealing used formerly to be done with *solder*, but this proved defective, on account of the hot iron partially melting the butter and injuring its quality by giving a bad taste to the parts affected.

For some years the soldering has been abandoned and the hermetic sealing is now done by a machine that seals the tin cold, without solder, by the clamping of the cover to the body of the box.

Although this plan of clamping seems simple enough, the machine that executes it has been for a long time the object of laborious research, as the clamp-work requires absolute perfection, since the slightest passage left for the air, were it as fine as the point of a needle, would be enough to ruin the products intended for keeping. This is, in fact, the essential point: the butter must not be in contact with the air, lest the oxygen of the latter oxidise the butter, and thereby produce the rancid taste that makes it uneatable.

The machine for sealing the boxes is a French invention; it costs, with the most recent improvements, about \$200.00, including the accessories needed for sealing boxes of all the sizes mentioned above. It can be worked by hand or by power, and the sealing is done very quickly. Any one of ordinary skill can learn the work in a very short time, and can then seal about 4,000 boxes of  $\frac{1}{2}$ , 1, and 2 lbs., in ten hours. Women, in the factories I visited, are generally set about this job. I worked the sealing machine myself, and I may say that, after an hour's practice, I had learnt the use of the apparatus perfectly; for the different parts of it are so very simple that I sealed boxes of every size in perfect form.

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The boxes being sealed, they are rubbed with fine sawdust to clean the exterior.

They are then stowed in cases of shape and form agreeing with the series. The dimensions of these cases agree with the sizes of the boxes they are to contain, and are made in the fourteen different sizes that follow :

For 100 boxes of $\frac{1}{2}$ lb.			For 40 boxes of 5 lbs.		
100	"	1 "	32	"	7 "
100	"	2 lbs.	16	"	14 "
50	"	2 "	8	"	22 "
50	"	4 "	8	"	28 "
24	"	4 "	4	"	44 "
			2	"	44 "
			1	"	44 "

The boxes being placed in the cases, sawdust is scattered over the interstices to prevent the boxes being jolted about during the voyage. The cover is nailed on the case, which is then ready for shipment, after the trade-mark of the maker and the direction and number of the addressee have been stamped on it with a hot iron.

I said, just now, that the machine for sealing the boxes was of French invention; the best machine for the preparation of butter, according to the method I have just described, such as the rotary, horizontal kneader, the smoother, and the vertical kneader, are also made in France, where their construction is carried to perfection. Long experience on the part of the preparers of butter must have guided the machinists, and the two elements combined have led to the production of perfect apparatus.

In other countries, the leading firms of Holland, Lombardy, &c., use French machines to the exclusion of all others.

The question of manufacture, or rather of the preparation of butter in tin-boxes, having been dealt with, I shall now relate the steps I took and the information I collected as to the marketing of this product. The greater part of this information applies equally to condensed milk, of which I shall speak further on.

I have already said that butter preserved in boxes only finding an extensive market in intertropical countries that have no milk, the raw material whence butter is produced, it is necessary to enter into correspondence with the chief firms which have branches in the colonies, and whose principal establishments are in Europe. This is what I did, through the obliging medium of one of the chief commercial agents of the colonies, on the Paris Exchange, who is in constant communication with Hamburg and London.

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I was put into relations with the heads of these firms, and the following is a summary of what I learnt from them.

The principal points for the exportation of preserved butter are :

1. Brazil, North and South; market very important; consumption enormous;
2. French and English West-India Islands;
3. Central American republics
4. British India;
5. China, Japan, Indo-China;
6. French colonies.

Here, then, is a field for exploitation large enough to admit of Canadian butter finding a place in it.

I mentioned above what should be the conditions under which the butter should be prepared and presented in order to find favour in these different countries. I will add that the butter of France, Denmark and Italy at present find their entire market in all the points indicated above, but the *consistence* of the butter is the principal point to be attended to, if it is desired to make it agreeable to the consumer. Moreover, it must be presented in good form, that is, in boxes carefully arranged as regards their make and effect, similar in colour and in every other point to the types already adopted. Under such conditions, the quality being equal, Canadian butter will find a ready sale.

I had with me, when I started on my tour, six samples of butter, made in different places in the Province of Quebec, towards the end of September last, and which I received in October. I offered these samples to be tasted, towards the end of November; they were in glass boxes, closed, but imperfectly, by metal covers screwed down. The butter was covered with calico, and under the calico was a  $\frac{1}{2}$  inch layer of salt. The flavour of the butter, though not what it would have been had it been packed in hermetically sealed boxes, gave general satisfaction to those who tasted it. Still, to be exact, I should say that fault was found with certain of the samples as having a greasy taste. This, I think, is easily cured, and springs, I am convinced, from the bad system of kneading the butter pursued in Canada. I have, on several occasions, sufficiently enlarged on this point to render it unnecessary to say more about it, so I will limit myself to this, that all who desire to succeed should begin by casting aside every inferior instrument. (1)

(1) As to the word *malaxer*, which I have translated *knead*, there is no other word for it in our language, though *kneading* is the very reverse of the action of a good *malaxeur*, or butter-worker. A. R. J. F.

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As to the consistence, an important point, that was thought to be satisfactory ; but to be certain about it, Canadian butter must undergo the test of crossing the line.

In spite of the defect I mentioned, my samples everywhere met with a favourable reception, and the exporters pressed me to persevere in the intention I expressed to them of striving to introduce Canadian butter on the colonial markets. All the firms assured me of their support, promising me large orders, but, on the preliminary condition, that samples absolutely perfect, both as regards preparation and the packing in tin boxes, be sent to their branch-houses in the colonies, in order to ascertain that the consistence of the butter, after having crossed the line, be perfect and that it be favourably viewed by the purchasers.

In short, after my tour, I remain convinced more and more thoroughly that Canadian butter, carefully made and prepared for exportation to the colonies, must succeed in occupying an important position on the colonial markets. But, in addition to these qualifications, the goods must be offered, even as samples, in perfect form, that is, the boxes must be made, sealed and stamped as are those sent from Europe.

As to prices ; at first, perhaps, some concessions must be made ; but the quality proving suitable and being scrupulously kept up, the early prices will rapidly improve.

Prices vary according to the season, and, the demand, more or less great, which fixes the market quotations. At present, they are about 24 cents the English pound, net.

In Europe, the price is always understood to be: free on board at the nearest port of shipment. For Canada, the price must be made free at Quebec or Halifax, whence the goods will be shipped either by sea, or by sea and land, to the West-Indies, Central America, Brazil, &c., on the one side ; and to India, Japan, Indo-China, &c., on the other.

The leading export-houses in the colonies have all a central firm in Europe, either in Paris, London or Hamburg, with which business is transacted either directly, or through accredited commercial agents.

These firms pay at 30 days from the date of dispatch of goods, with 2 % discount. This is the usage generally adopted, and to it Canadian commerce must conform, if it wishes to do business.

As to direct dispatch of goods to colonial houses, without passing through the main houses in Europe, or to colonial houses that have no establishments on that continent, it would be full of dangers and unforeseen accidents, against which I cannot too earnestly warn Canadian manufacturers.

I will close what concerns preserved butter, by giving the prices of boxes according to their contents; they are as follows:

lb.	$\frac{1}{2}$	1	2	4	5	7	14	22	28	44	lbs.
	\$2.15	4.00	5.50	8.00	9.40	10.80	17.60	24.00	29.00	41.00	

These prices are by the 100 boxes, ready for sealing by the machine; the price of which I gave above.

I will add nothing more on the subject of preserved butter, but I hold myself at the disposal of all interested therein, as regards additional information, which may be useful to them, and which I shall feel a pleasure in imparting to them as far as lies in my power.

I am about to take up another point in my programme: the manufacture of *condensed milk*.

#### ON CONDENSED-MILK AND ITS MANUFACTURE.

Before giving the method of manufacturing condensed, or concentrated milk, which is the same thing, I will relate its history in a few words:

Milk being easy of decomposition, difficult to carry about, and not readily preserved for any length of time, is usually consumed where it is produced.

By depriving milk of a great part of the water it contains, about, on an average, 85%, by a process that does not alter its constitution, as, for instance, by boiling it in the open air, and by enclosing it in hermetically sealed vessels, it was found, about thirty years ago for the first time, possible to preserve its special properties. Under these conditions, it is transportable, without any change, to any distance, and its original bulk is considerably lessened.

Very great service was rendered by this concentrated milk to the troops during the war in the United-States. Since that time it has been introduced into the rations of both soldiers and sailors, and its preparation has increased year by year until the trade has assumed considerable proportions.

This industry was introduced into Switzerland, in 1867, by Mr. Mage, then American consul at Zurich.

At present, there are seven very large factories in the canton of Zug, and one at Freiburg, called "Anglo-Swiss." From these several factories, 25,000,000 boxes of condensed milk are sent out every year.

It is a long time ago since I was astonished for the first time to see that Canada, that dairy-country *par excellence*, made no attempt to exploit this fruitful and important branch of the dairy-industry. For Canadian

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milk from the province of Quebec is, generally speaking, of very good quality; and, besides, it can be had at a price that, while it pays the farmer, would be also remunerative to the manufacturer. As to the sale of the manufactured products, that would be as advantageous as in the case of preserved butter, and would be carried on by the same means. Condensed milk is no new article; it has given its proofs long ago, it has taken well in the colonies; all the chances, then, are in favour of any factories that may be established in Canada.

I, therefore, earnestly counsel Canadians to establish in the province of Quebec factories like those which are doing so well in Switzerland, and which are at this very time being started in France. Before long, these factories will assume an important position, and, thus, the void that exists in the national dairy-industry of Canada, will be filled up.

Condensed milk, then, is, as I have just said, milk that has had a notable quantity of the water it naturally contains evaporated. This, the manufacture of this article has for its object to concentrate the milk, and finally to reduce it to a state of syrup favourable to long preservation.

In order to prevent the coagulation of the *casein*, and to ensure that the milk shall return to its normal condition on the simple addition of water, the evaporation must be conducted at a low temperature; and not be pushed too far, lest the sugar of milk be crystallised; so the syrup of milk, when finished, should still contain from 25 to 30 % of water.

Conducted in this way, our manufacture would appear to be, in principle, easy enough, since it comes to the simple form of an evaporation of water; but, in practice, the preparation of condensed milk is rather complicated, and requires first-rate apparatus and great attention and care in the different processes, of which I am now going to give a description :

First of all, I may as well say that, in every factory, the milk dealt with is at least partly skimmed; then, to give it a pleasanter taste, a considerable proportion of cane-sugar is almost invariably added. Thus treated, the concentrated liquid becomes less fluid, syrupy, and, in this state, forms an obstacle to the separation of the lactose, which exists in the condensed milk in a crystalline form. The sugar *may* also have an anti-septic effect, though this point has not yet been thoroughly settled.

Milk, intended for condensing, must be of the most perfect kind, absolutely sound. It must be tested with profound honesty, and if doubtful in quality, should be tested with the *lacto-fermentator*. All bad milk must be firmly rejected, for the smallest quantity of it might prevent the keeping of the whole lot.

The milk, being found to be of good quality, is then sent through the separator; so it must be confessed that the cream forms no part of the finished product of the factory.

To be perfectly sure that the milk is now—that is, after skimming—in perfect order, it is warmed for a few minutes, in a hot water bath, up to 170° F. For this purpose, it is put into cans holding from 90 to 100 lbs., which are placed in a double-bottomed, sheet-iron vat filled with water, and heated by steam circulating between the two bottoms. When the milk has risen in temperature to 175°, the steam is shut off, the milk is examined, tasted, and if any is found to be in the least tending towards decomposition, that can and its contents are put aside. In countries where the use of antiseptics is allowed, they are at this point put into the milk, in order to be certain that it shall not *turn* during the consecutive heatings it will have subsequently to undergo.

These antiseptics are : boracic acid and salicylic acid, but alkaline carbonates, such as carbonate of soda, are never used, because they communicate a bad taste to the milk.

The good quality of the milk being ascertained, it is poured into a double-bottomed copper boiler, heated by steam, and raised to the boiling point; the milk is strained at this point through a fine cloth sieve, in which the sugar intended to be added has been placed.

This sugar must be of the purest kind, pleasant to the taste, and perfectly white. Even the very finest beet-sugar will not answer, it must be canesugar.

The proportion of sugar used is from 11 to 13 % of the milk operated on; it melts rapidly, and the sweetened liquid is ready to be condensed. In the factory I had the good luck to go over, a rather difficult privilege to obtain, they add, besides the sugar, a small dose of *gum-tragacanth* with a view to prevent the precipitation of the milk-sugar (*lactose*.)

I mentioned above, that the concentration of the milk ought to be conducted at a low temperature; now, as in the open air the evaporation of liquids only takes place at boiling-point, which is, for milk, 212° F., or thereabouts, recourse has been had to boiling *in vacuo*, that is, in an apparatus deprived of air, in which water boils at 120° F. This sort of apparatus has been long in use for the condensation of the juice of the sugar-factories, and it has since been applied to the preparation of milk. I described it, and its picture is given, in my "Manuel de l'Industrie Laitiere du Canada," to which my readers can refer. I will now endeavor to explain the different phases of the operation :

To effect a condensation, or, in technical terms, *une cuite*, a partial vacuum is first made in the apparatus, and some of the unsweetened milk is let into it, penetrating by means of atmospheric pressure.

When the apparatus is about one third full of milk, the steam is let on very gently, circulating between the two bottoms, so that when the liquid has risen in the temperature to 120° F., the ebullition is tumultuous. At this point the management of the operation is very delicate; the man-

ager must pay attention to the introduction of steam from time to time, so that the milk boil too fast, away by that duty should be to condense it.

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ager must pay the greatest attention to the heating and to the gradual introduction of the milk, as well as, if necessary, of a small quantity of air, from time to time, to check the tumult of the ebullition. In fact, if the milk boil too fast, there would be a loss, as some of it would be hurried away by that part of the apparatus called the "condenser," whose sole duty should be to draw off the steam produced by the concentration and to condense it.

By degrees, the ebullition slackens, the vacuum is increased, and then the sweetened milk is introduced, regulating the feed so that no grains be produced in the milk. Here then, is the chief point, and here the workman should keep his attention wide awake: taking samples from time to time, so as to find out to a nicety the state of his *goods*. (1)

After a certain time, the operation goes on regularly, the thermometer keeping at 120° F., and the feed continuing gently until the liquid has attained a certain level in the apparatus. The workman takes occasional samples, and allows a little of the condensed milk to flow on to his finger, to see how it behaves. If it be fluid, the operation is continued; if, on the contrary, it be syrupy, that is if it do not moisten the finger, the operation is finished. However, the close of the operation may be judged of by means of an *areometer*, on the stem of which is a mark up to which the instrument should sink in the liquid, when it is sufficiently concentrated.

The boiling over, the steam is shut off, and air is admitted into the apparatus through a special tap. The contents may then be run off by a valve in the lower part of the apparatus.

In some factories, the concentrated milk is received into cylindrical cans, holding 50 lbs. each, which are taken to the refrigerator, where the liquid is *roused* by wooden oars, moved either by power or by hand, during the whole time of cooling, which is effected by means of a current of cold water circulating round the cans. This operation takes about two hours. A factory, newly fitted up, which I saw, employs a less primitive way of cooling than this: the condensed milk, all hot, is run in a very thin sheet over wide undulating metallic surfaces, furnished with an automatic rake, under which, in the opposite direction to the milk, runs a stream of very cold water. The use of the rake is to prevent the crystals of milk-sugar from attaching themselves to the sides of the refrigerator.

When the goods are cool enough, all that remains to be done is to pack them in tin-boxes for transmission to the countries where they are to be used. These boxes must be hermetically sealed, and are made in exactly the same way as those I have described as being used for preserved butter. They are made in only one size; that holding a pound English. Then, the boxes have only to be closed with a tin-cover, fastened by the clamping-machine. In a few days, a ticket is glued on the boxes, which are then ready for shipping, when they are packed in cases holding 48 boxes

(1) *State of his goods*: a reminiscence of former days when I made many a thousand gallons of beer. A. R. J. F.

In this industry, in addition to the care recommended to be taken throughout all the different operations of the manufacture, it is absolutely necessary that the most minute attention be paid to perfect cleanliness. After each boiling-off, a lad is sent into the principal apparatus which he has to clean thoroughly; and all the materials which are used about the milk, are carefully washed and steamed before being employed in the next operation.

#### CONDENSED-MILK WITHOUT SUGAR.

Up to the present, we have only been talking about condensed milk with sugar added to it; some is made, though in much smaller quantities, without sugar. In the latter case, the condensation is more difficult, and the product seems to have less chance of keeping for a length of time. Italy is the chief seat of the manufacture of sugarless condensed milk, whence it is sent at once, in hermetically sealed cans of about 100 lbs., to London, where on arrival it is mixed with water, and retailed out daily for the consumption of that immense town.

#### CONDENSED-MILK WITH ITS CREAM.

I told you, too, that milk, intended to be condensed, was previously skimmed. It is certain that milk with all its cream can be condensed; but besides that the manufacturer gets a good profit from the butter he makes with the cream, he prefers condensing skimmed milk, because he can make from it an article of more taking appearance. For, when the cream is all in the milk, the former rises in the boxes, and it is not easy afterwards to get it to mix with the mass. Thence derives an appearance that is unpleasant to the consumer; besides, this cream sometimes contracts a disagreeable flavour. Anyhow, the public does not complain of condensed skim-milk: which is the main point.

#### THE COST PRICE.

A certain capital is always necessary to start a condensed milk factory, both for the installation and for floating funds.

The motive-power must be sufficient for the working of the separators, churns, the air, and water-pumps, &c.; and, besides, the production of steam enough to heat the different apparatus is no trifle.

With the system at present in favor, (evaporation *in vacuo*.) the apparatus for evaporating and condensing costs a good deal; for a small factory, capable of dealing, at three boilings-off a day, with from 15 to 20,000 lbs. a day, this apparatus alone costs \$1,500.

The last factory I saw, in France, cost \$12,000.00 for the installation; besides that, we must of necessity calculate on a certain amount of floating capital, by no means small either, since the goods must sometimes be kept in stock for some weeks before being sent to market.

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Sugar.....

30 boxes...

Labour .....

Packing cas

Cr. by:—Butter 4½ c.

30 boxes of

Skim-milk 1

In order to give those interested in the business as complete information on this point as possible, I have obtained *data* from the most trustworthy sources, so that I can state:

1. The staff necessary to work a factory of the size mentioned above, which would be the one best suited to the means of the Canadian industry at first starting;

2. The cost price for the 100 lbs. of milk treated;

3. The profit, the selling price being given;

The number of persons employed is about 23, consisting of:

2 men receiving milk;

4 " at the separator, the creamery, and preparing the sugar, &c.;

2 " at the condensing apparatus;

2 firemen and engineer;

1 swine-herd;

1 lad to help to clean the apparatus;

12 women for packing, ticketing and sealing the boxes.

—  
24 hands in all.

According to the information I obtained, the manual labour of these hands would cost about 8 cents per 100 lbs of milk treated. As to the general outlay, including coal, of which the large amount of from 15 to 20 lbs. per 100 lbs. of milk will be used, and the packing-cases, it will come to 25 cents per 100 lbs of milk.

From these *data*, we calculate the cost price, for manufacturing 100 lbs. of milk, thus:

Dr. to:—Purchase of 100 lbs. of milk.....	\$0 90
Sugar.....	0 75
30 boxes.....	0 90
Labour.....	0 08
Packing cases, &c.....	0 25

Total..... \$2 88

Cr. by:—Butter $4\frac{1}{2}\%$ at 20.....	\$0 90
30 boxes of milk at \$4.00 the case of 48 boxes..	2 50
Skim-milk for the piggery.....	? ?

Total..... \$3 40

To profit per 100 lbs..... \$0 52

It would, however, be wiser not to accept these figures as being too rigidly accurate, as their elements, as well as the yield, vary according to the locality; but it is certain that this industry is a lucrative one, and that the Province of Quebec can win a place on the market that will pay her well.

The sale of these goods, as I mentioned above, would be carried on in the way and by the same means as the preserved butter, and the commercial relations I have established will answer as well for the one as for the other.

I have now, Gentlemen, arrived at the end of the engagement I entered into with you before I left Canada. But I did not wait for the present time to acquaint you with my proceedings and their results; for, during the tour I have just brought to an end, I have been in constant communication with M. J. de L. Taché, your secretary.

I have done all in my power to make this report as easy to be understood as possible, that the information therein contained may be useful to all concerned, and I shall deem myself fortunate if it meets at your hands with the kindly reception that I have tried my best to make it deserve.

While scrupulously discharging the agreement I entered into in my letter of the 25th of last July, I must add that I made use of the important connexions I formed during my tour to study the progress made by the dairy-industry, during the last two years, in Europe, but especially in France. I collected some interesting pieces of information, which I will complete before my return to America, for as soon as the winter is over, that is, in about two months, I shall make another tour through the dairy countries. Meanwhile, I am employing my time in studying new processes of manufacture, particularly those relating to *condensed-milk*. I may even say, already, that I have every reason to hope to be able to offer, on my arrival among you, a new and economical system, based on an as yet unused principle, which will attain the double object of effecting a notable reduction in the price of the apparatus and the cost of manufacture, as well as of turning out a very superior product.

I am also studying the practical application of a process, for the preservation of milk in a fresh state, suggested to me by an eminent *savant*, M. Duclaux.

And, lastly, I am working towards the perfecting of that system of preserving milk in its fresh state of which I am the inventor, and which has been in practical use in France during the last five years.

Besides, I intend to bring with me to Canada some new methods of

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information, I beg

SUPPLEMENT OF  
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To the members of the  
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making cheese that I intend to exploit, and which will endow your country with a new and profitable industry.

Meanwhile, until I return to you with my fresh cargo of special information, I beg to remain, with &c., &c.

E. MACCARTHY, C. E.,

Director of the practical School of  
Dairy-Industry of the province of Quebec.

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SUPPLEMENT OF THE REPORT TO THE DAIRYMEN'S ASSOCIATION OF THE PROVINCE OF QUEBEC.

*To the members of the Board of Directors of the  
Dairymen's Association of the Province of Quebec.*

Gentlemen,

M. J. de L. Taché, your secretary, informs me, in his letter of February 12th, that you wish to have a supplement to the report I sent you on the 15th January, and, at the same time, he tells me exactly on what particular points you desire additional information. These points are divided into paragraphs, which I set at the head of my replies, in order to make the subject more clear.

*Point No. 1.*—“M. MacCarthy, at p. 5 of this report, says that this is the report promised in paragraph 4 of his offers; a previous report during his tour, and at paragraph 5, a circumstantial report on his return. The present report then is not the report promised to be sent before M. MacCarthy was to be paid his balance.”

The paragraph 4 of my letter of 25th of last July, to which you refer, says that “*I will, during my tour of investigation, keep myself in communication with the Association, and make a previous report to the convention*”; then, paragraph 5 adds: “*After this tour, I will make a circumstantial report, comprising the results of my inquiries into the two industries, preserved butter and condensed milk.*”

As to paragraph 4, I think I have kept my promise most scrupulously; since, during my tour of investigation, in November and December last, I regularly kept the Association informed of my proceedings, as my letters to M. J. de L. Taché, your secretary, testify; and I cannot doubt but that he has communicated their contents to you.

As to the offer I made of sending a previous report in time for the Convention at Montmagny, and, afterwards, a circumstantial report at the

end of my tour of investigation, that was because I thought that your convention was to take place in November, as your secretary had told me, that is, at a date when it would have been impossible for me to have furnished you with a completed report. The convention having, on the contrary, been held at the end of January, and M. Taché having given me timely notice of this change of date, I blended the previous report and the circumstantial report together, and, on the 15th January, sent you the combined report, your remarks on which you have already forwarded to me.

In short :—1. I kept myself, during the whole of my time, in constant correspondence with your association, by means of my letters to your secretary, M. Taché, in accordance with the verbal understanding entered into before my departure ;

2. I thought it my duty to make my report as a whole, since the date of your meeting had been altered from the end of November (the time fixed by M. Taché) to the end of January ; and this latter date enabled me to send you in one report what I might have made two of, that is, a definite, full report, which rendered a previous report valueless and unnecessary.

My conscience then tells me that I have completely fulfilled my promise ; but that is no reason why I should not subsequently give you the additional information you express a desire to receive.

*Point No. 2.*—“ At page 8 of M. MacCarthy’s report (page 187 of the present volume), a paragraph, expressing the idea that we have only two markets open to our butter, our own and the market of intertropical countries, contains an error ; for it has been proved that the English market will be open to us as soon as we shall have taken as much pains to make butter fit for that market as M. MacCarthy tells us we must take to make butter fit for consumption in the tropics.”

This, Gentlemen, is only a criticism on my opinion as to the markets that were open to you, and I only hope the future may prove you to be right. Your butters may find buyers in England ; I will not throw the slightest doubt on that ; while, even such as they are at present, their quality is all in their favour. But making sales is not everything ; profits must be considered ; the price must remunerate the seller, that is, the producer. Now, I repeat, without hesitation, what I said in my previous report : In Europe, production increases daily, with the best means of making, like you, articles of the finest quality. But, consumption does not increase in the same ratio as production ; so it happens that the price of butter during the last few years has fallen considerably. In this case, you will allow—won’t you ?—that the interests of the producer are attacked, while the middle-man, that is the dealer, if he sells low, has previously taken care to buy low. Now, I told you, and I repeat it, the sale-price of butter has fallen, and yet the cost of producing it remains the same. This is the present condition in which European butter-makers find themselves, in consequence of the superabundance of goods made.

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Let us allow that plenty of your butter comes on the English market, induced as you may be by the present prices, that you think are still fair, to send it there; at present, this new contribution to the market will have not the slightest effect on the production of Europe, which will at any rate continue its onward stride, as long as it fulfils the needs of certain districts of Europe, in which dairying is the sole resource of the farmer. But if this contribution has no effect on production, it will indubitably have a very important effect on the sale-price, seeing that the more plentiful any commodity is, the lower will be its price; and what will that price be when Canada shall send enormous quantities of butter to compete in the European markets with the butter of Europe? I would draw your attention, on this point, to the effect on the English market of recent arrivals of Australian butter, which are looking for an outlet there.

Lastly, I will add that your butter, though of excellent quality, will not enjoy the same advantages as the butters of Denmark and France, which reach the English market in a perfectly fresh state. The chief reason for this is the long voyage your butter has to undergo. Consider this; with the organisation possessed by the butter-producing countries of Europe, the butter made to-day is sent off to London at night, where it arrives the next morning. Judge, then, what a freshness, what an aroma is evolved by such butter, and think how different it will be with yours, sent from the factories at least eight days after its manufacture, and still having another week, at least, to wait before it reaches the market: fifteen days in all.

In support of this opinion of mine, I will add that, the longer we live, the less we shall find that *salt butter* is in request on the European markets. *Fresh butter*, without an atom of salt, is what is wanted. Well, try, and send your unsalted goods to England and offer them in that style a fortnight after making: I fear greatly you would find the first experiment of this sort so disastrous that you would not feel inclined to try it again.

No doubt, the English market is open to you, but only on condition of your running the risk I have pointed out to you, that of meeting with a general fall of price in all butters, caused by the arrival of your shipment. On the other hand, I do not think that, at least at present, with your organisation you are in a position to send anything but salt butter, and this never takes the highest price.

I will close these remarks by telling you, moreover, that your butter-production, even now, is only carried on in summer, and that is the season when its production is also at its height in Europe, and when, consequently, the price is always very low. Added to this is the difficulty you will have in the hot weather of transporting your butter, which owing to the effect of the heat, will but too often reach the market in such bad order that I fear you will have to lose considerably by it.

I do not go so far as to advise you to slight the English market altogether. With an improved organisation, you may perhaps avail yourselves

of it, but, as I fear you will never find it very remunerative, I point out this danger to you, and at the same time, I say: Open your eyes to the inter-tropical countries with their large consumption, which offer you such an extensive market, and at which your goods are sure to arrive in absolutely advantageous condition, provided always the quality of your butter be indisputably good.

In laying before you my opinion, now and on a previous occasion, I trust that you will believe that I have been guided by no preconceived idea, by no *parti pris*. Neither am I led by any consideration of personal interest, but I am simply a seeker after the truth, whence, when found, must flow effects tending to your benefit. I act freely, without any under-handed motive, having only one aim: to point out to you, on the one hand, a rock which I see ahead, and on which I have given you my thoughts; and, on the other, an opportunity which seems to me to be a safe one, and on which I feel it my duty to insist.

*Point No. 3.*—"At page 11 of his report (page 189 of this volume) M. MacCarthy gives us this piece of information: that he has bought a secret from the makers of preserved butter, for preserving butter by means of an antiseptic, with the rights of exploiting this secret process over the whole of North America. Now, this does not seem to us to be information available to us, unless M. MacCarthy will place it at the disposal of the Association for a reasonable sum."

I said in my report that I had succeeded in securing the property, for North America, of an antiseptic, and I added that I would put it at the disposal of Canadian dairymen who wish to secure the long preservation of their butters.

How, then, could I refuse to behave to the Dairymen's Association in the same way I was pledged to behave to private persons? The antiseptic is made solely in France, and cannot be made elsewhere, while it forms for the inventor a secret of manufacture which belongs to him alone and which he has not imparted to me. As to the right of sale in North America, I bought it, paying for it \$200.00.

This antiseptic only raises the cost of butter about a cent a pound. It is one of those things, with which I made experiments, and the most successful of all they were; I believe it will turn out admirably useful. The cost-price is \$2.00 a pound, but very little is required to ensure long preservation, and this makes it practically useful. I am perfectly willing to cede my right of sale to the association.

*Point No. 4.*—"At page 14 (page 190 of this volume) M. MacCarthy tells of factories that manufacture certain instruments, and of companies that deal in preserved butter. As he also says that recourse must positively be had to these factories and companies if we wish to organise the manufacture of preserved butter here, he ought to have completed his statements by giving us the names and addresses of these establishments."

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I willingly concur in the desire of the association expressed in No. 4, by filling up an involuntary omission on my report; I say *involuntary*, for I had not the slightest interest in making the omission.

The best apparatus for making preserved butter are manufactured by Messrs. Simon & fils, Cherbourg, France. I saw these at work in all the principal preserved butter-factories I visited, and they produce results.

I entered into negotiations with this firm in March last, and it has appointed me its agent in Canada, and, in the contract, I obtained power to enable the Dairymen's Association of the province of Quebec to profit by the advantages that will accrue to the said province by the agency: I willingly unite this affair with the antiseptic-agency, just mentioned, without seeking to exact any additional payment. For this purpose I subjoin a catalogue of the firm of Simon & Sons, mentioning the prices on which will be made to the Association, in my place and stead, the following discounts on the sales to be effected by it from the 1st of June next.

On the horizontal butter-workers, p. 32-33 of catalogue, 20 %.

"	"	"	34	"	15 "
"	"	"	35	"	10 "
"	vertical	"	36	"	20 "
"	"	"	37, 38, 39	"	10 "

For those machines sent to Canada that require special packing in closed cases, the price of packing will be invoiced at 5 % on the gross cost of each machine.

Payment, by cheque on Paris, payable on demand, with a discount of 3%; or by cheque on Paris, 30 days after delivery, with 2 % discount. Delivery to be made at Cherbourg, and shipment via Havre or Liverpool.

The conditions entered into between the house of Simon and me, and which I cede to your association as regards the province of Quebec, are as follows:

1. I am the sole agent for Canada, and of course, for the province of Quebec.
2. I have to keep the firm "posted" on all the machinery, connected with the dairy-trade, made in or imported into Canada.
3. The discounts mentioned are to be allowed to me, and consequently, will be the right of your association on all the orders sent through its agency. On orders sent directly by private persons, those discounts will be reduced to 5%.
4. The agency is granted for a term of three years, from 1st June next; renewable the third year, if the sum total of dealings amounts to \$1,000.00 the third year.

5. The dealings which will be treated by Messrs. Simon & Sons as *direct orders* will be reckoned as part of this sum of \$1,000.00

6. The Dairymen's Association of the province of Quebec may be substituted in my room and place for the sale of the goods of the firm of Simon and Sons in the province of Quebec.

So much for the manufactories of implements mentioned in the first part of your point No. 4; I do not think that I could have made better arrangements.

As to the houses that export butter to the colonies, I annex a list of the principal and most trustworthy firms, who order from 1,200 to 1,500 cases at once, that is, from 120,000 to 150,000 boxes of butter.

Messrs. H. Ledoux & Co. Demerara, (British Guiana).

J. P. de Castos and Co., Santos, (Brazil)

J. Crud, 70 Rua d'Alfandega, Rio de Janeiro, (Brazil)

C. Benda, 20 rue Meslay, à Paris, (branch at Yokohama)

Heurtematte, Panama.

Comte and Mabut, Hanoi.

The widow Delatorre, 4 Faub. Montmartre, à Paris (branch at Panama.)

Porlier et Molna, 11 pass. Saulnier, Paris (China, India, Japan, Brazil.)

L. Roux, 34 rue des Petites Ecuries, à Paris, (China, India, Japan, Brazil.)

Gysin et Schoeninger, 6 rue d'Abbeville, à Paris, (branch at Tonquin.)

Boulard, 146 rue Montmartre, Paris, (branch at Tongking and in L. Delacre, 9 rue Bleue, Paris, (West-Indies, Central America.)

Cypriano Aharado et Cie., 13 rue Hauteville, Paris, (China, India, African coast.)

S. Boas et Cie., 8 bis, rue Martel, Paris, (Brazil, Tongking.)

Simon, 54 rue Lamartine, Paris, (Tongking, Japan, Cochin-China.)

Bigne fils et Gam, 74 rue Hauteville, Paris, (Madagascar)

Many other export houses there are, but I have only mentioned those that are in every respect worthy of confidence.

*Point No. 5.*—"It seems pretty evident from the tone of M. MacCarthy's report that he aims at acting as paid agent between our association and the firms to whom we should have to apply on the subject of the matters mentioned in his report."

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I trust that after what I have said, and after the proofs I have given of my disinterestedness towards the association, this conclusion will spontaneously fall to the ground, and that the feeling that inspired it will freely recognise its error. I have never entertained the thought of being the paid agent in a set of affairs that, for the present at least, are quite problematical. I can, therefore, only protest with all my power against the idea imputed to me in your 5th point.

*Point No. 6*—“ M. MacCarthy only the more forcibly leads us to the conclusion that we ought to expect from him a second report, in that, in winding up his first report, he tells us at pp. 28 and 29 (page 200 of this volume), that he is about to return to this country with a great deal of fresh information and many new ideas which he was not able to complete before the drawing up of his first report, and which will enable him to give us, in addition to the processes he has just explained to us, something more, to justify us in having put him in a position to display to us the progress that has been made in those industries, which progress we are already acquainted with through the essays on it we have seen by different authors.”

At the close of my report of last January, I announced, in effect, that I entertained ultimate expectations of collecting some interesting elements concerning our dairy-industry, such as :

1. A new process for making condensed-milk.
2. The practical application of a process for preserving butter in the fresh state.
3. The perfecting of my system of preserving milk in a fresh state for the consumption of the colonies.

The new process of making condensed milk was described to me by M. Louis Bochet, a specialist-engineer of the section of dairy-industry in the firm of F. Fouché, machinist, 38, rue des Ecluses-St-Martin, Paris. This engineer asserted before me that the new process of condensing milk, belonging to his firm, costs for the installation only one-eighth of what the Swiss process costs, and besides, the milk condensed by this method had no burnt flavour (*goût de cuit*). The process, said M. Bochet, is based on an undisputed physical law, and the firm of Fouché will guarantee the proper working of its apparatus, as well as the quality of the results obtained.

This is the only step in progress made in the manufacture of condensed milk, but it is a most important step ; since, thereby, the expense of installation is greatly reduced, the working of the manufacture becomes simpler and more practical by the reduction of the cost-price, and besides, because the quality of the product is better, since the evaporation is now, it seems,

carried on at a temperature of 30° cent. (86° F.), (1) which does away with the burnt flavour which, it must be confessed, injures all condensed milk, even when the process is conducted *in vacuo*.

Mr. Fouché, having no apparatus fitted up for this new process, could not give me an opportunity of ascertaining its value practically, but he is disposed to enter into contracts with a person, or a company, of *bonâ fide* intentions, to fix up an apparatus for them.

Here, then, is before you all I know about condensed milk, all I have to add to the information supplied in my report.

As to the preservation of butter in a fresh state, this question is certainly occupying attention at present, and the researches are now being directed to the investigation of the action of carbonic acid gas, which, by investing the butter on all sides, prevents its oxidation, since it hinders all access of air, and every one knows that, in most cases, the decomposition of butter is due to its oxidation by the oxygen of the air.

There is, doubtless, a field open to the application of this new principle, acknowledged as a good one after several successive experiments. I, myself, am employed in searching after an apparatus that may answer the desired object, and I am hopeful of at last making the process practical; but as yet I can say nothing positive about it.

I have just shown you on what principle my researches rest, but if any one should succeed, before me, in making the process of practical utility, I shall not be jealous, but shall rejoice in having contributed my assistance to an object useful to all the world.

Experiments have taught me, in fact, that preserving butter "in the form of grains, in brine" is not always successful, and although it may seem very simple, it is not, really, a very easy process. The preservation in carbonic acid requires, it is true, special apparatus, and the end at which I am aiming is the introduction of the preserving element even before the butter is made, that is to say, during the progress of the transformation of the cream; so that the resulting product, already strongly impregnated with the agent that expels the air, may remain in an environment of carbonic acid, completely protected from all decomposition caused by contact with the air. If one can succeed in preserving butter during several months, this, I feel, will be an appreciable step in progress presented to the dairy-industry, for it will enable the makers to keep it off the market till the prices are favourable.

Before leaving the question of the preservation of butter, I feel bound to say that news of a fresh process has just been whispered about, though the inventor keeps the process a profound secret. He asserts that he can keep

(1) To convert centigrade degrees into Fahrenheit:  

$$F. = \frac{9c}{5} + 32; \text{ thus, } \frac{30 \times 9}{5} + 32 = \frac{270}{5} + 32 = 54 + 32 = 86. \text{--A. R. J. F.}$$

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(1) Vve is, of course an a  
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(1) *ârogène*=air-producer.



butter "in grains," perfectly fresh, without the addition of any substances, for eight or ten months. After having had samples of butter preserved by this process in my possession, I tried to get to know how it was preserved, but the demands of the inventor were so high that I had to desist. He wanted, from any company that wished to acquire the right to use the process \$20,000! If any member of the Association should care to enquire further into the matter, the address of the inventor of this process of preserving butter, is:

Madame Vve. Blanchon, propriétaire, à la Vallette, en St. Maixant. (Creuse), (1).

I must not forget to mention a new way of making butter, of which I heard favourable reports, and which, it would seem, produces an article of greater purity and one, therefore, more easily preserved. I mean the *aérogène* churn, made by M. Gilson, at Béthune, (Pas de Calais,) France.

I took the following from a report made on this apparatus:

"The *aérogène* churn is founded on a system the effect of which is to cause innumerable bubbles of air to pass through the cream or milk, which air has been previously purified, and thus to ensure a sound and rapid production of butter (1).

This invention, a very original conception, is due to the purest piece of luck: a learned Italian observed, in an experiment in his laboratory, that, by the infiltration of oxygen through milk, he obtained in a few instants small lumps of butter. Nobody had, as yet, observed this phenomenon, and it was from this accident that the student was led to apply the infiltration of *Pasteurised* air to the making of butter.

"In twelve minutes, on an average, after the infiltration of air, the butter "has come"; all that remains to be done is to withdraw the false-bottom, on which the butter will be found.

"From 12 to 15 % more butter is produced by this than by any other known churn. The buttermilk only retains 0.07 of fatty matters, that is, only a trace.

"Even when stale cream is used, the butter is absolutely pure to the taste.

"Rancid butter may be made fresh again, if it be submitted, with the addition of some fresh skim-milk, to a churning of ten to twelve minutes; the volatile oils and the butyric acid being then eliminated by the aerogenic churning.

"The butter-milk left after churning fresh milk, remains in the state of skim-milk, entirely free from sourness.

"A young lad can churn from 100 to 120 lbs. of cream."

This is the most recent invention I met with, and I can freely state that experiments, made in my presence, proved the entire truth of what

(1) *Vve* is, of course an abbreviation of *veuve* = widow; and *propriétaire* = our word "freeholder," A. R. J. F.

(1) *Aérogène* = air-producer.

had been advanced. Unfortunately, the price of these churns is high, and, besides, I do not think that, at least at present, they are adapted to practical use, except in small concerns.

Lastly, as regards the preservation of fresh milk, I have made many attempts at perfecting the system I have been in search of, but, up to the present, I have not succeeded in obtaining the wished for result, and my process still continues to be exploited in the same form that it was at its first invention.

Generally speaking, what I have observed in the improvements made in connection with the dairy-industry in Europe, rests less on new processes than on the more careful methods introduced into the manufacture of the goods, and especially on the requirements of the managers of the factories, who more and more compel their workmen to observe minute cleanliness in all operations in the dairy. This is a most important point, and one to which the attention of producers cannot too earnestly be called.

*Point No. 7.*—"Your committee has arrived at the final conclusion, submitted for your approbation, that the present report of M. MacCarthy demands correction as regards the defects mentioned above, and should be completed in the second report, which he will be good enough to present to us on his return."

What precedes satisfies this last demand, as I have completed my report in compliance with the request you expressed to me.

I have not waited for my return to Canada to send you this supplementary report, as I was afraid that family affairs would detain me some further time in France. Besides, allow me, Gentlemen, to remind you that my final arrangement with the association does not imply that my report is dependent on my return.

Indeed, in consequence of the modifications introduced by M. Bernatchez, your president, into certain parts of my proposal of July 25th, it was definitively understood between him and me, through the intervention of your secretary, M. Taché, who himself arranged the terms of the modifications, that the payment of the balance due to me should not be dependent on my return, *but expressly on the transmission of my report to the board of directors.* I have in my possession both the letter from your president on this subject, dated the 4th of last August, and the explanatory letter of M. Taché, which accompanies the former, dated the 7th of last August.

I have done all in my power to give you satisfaction and to dissipate any suspicions you may have formed that I had been acting for my own interests; and I trust that now there will be no motive to delay the payment of my demand, which is the just due of an agreement loyally fulfilled on my part.

Accept, Gentlemen, the expression of my distinguished sentiments.

E. MACCARTHY.

Nantes, May 10th, 1892.

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Only one  
"La Belle"  
M. Joseph Pin  
The follow

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Total

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Butter

Lbs. of

M. Joseph P.  
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(1) On the 4th day  
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cow, only gave 14 lbs.

COMPETITION OF REGISTERED CANADIAN COWS.

Only one cow was entered for the competition of 1891:

"La Belle de Ste. Monique," No. 25, L. G. R. B. C., the property of  
M. Joseph Pinard, Grand St. Esprit, Ste. Monique, county of Nicolet.

The following is a summary of the report of the test of this cow.

Test begun the	4th July 1891.
Quantity of milk given each day.	lbs. oz.
1st day.....	45
2nd ".....	44
3rd ".....	44
4th ".....	48
5th ".....	30.8 (1)
6th ".....	37.8
7th ".....	48
	-----
	288 lbs.
Total quantity of cream.	35 lbs. (2)
Total quantity of butter,	11 lbs. 9 oz.
Butter from 100 lbs. of milk.	4.017
Lbs. of milk per lb. of butter,	24.90

M. Joseph Pinard was awarded a price of 40 dollars for his cow "La Belle de Ste. Monique."

(1) On the 4th day of the test, the cow had an attack of indigestion, and remained two days without eating.

(2) The 11 first milkings gave 21 lbs. of cream; the 10 last, owing to the illness of the cow, only gave 14 lbs.

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e terms of the modifica-  
ould not be dependent on  
rt to the board of directors.  
resident on this subject,  
letter of M. Taché, which  
ust.

satisfaction and to dissipate  
been acting for my own  
otive to delay the pay-  
greement loyally fulfilled

inguished sentiments.

E. MACCARTHY.

# RECEIPTS AND EXPENDITURE

OF THE ASSOCIATION FOR THE YEAR 1891.

## RECEIPTS.

Grant to the Association, acc. (1).....	\$1,200 00
“ “ balance from 1890.....	500 00
“ to the school factory (2).....	Memorandum
Interest for the year.....	0 00
Subscriptions in hand.....	351 00
Sales of reports.....	6 90
From visits paid (1890).....	3 00
Collections.....	0 00
Divers.....	11 49
Balance in hand, 1890.....	175 39
Grant for syndicates.....	1,000 00
	<hr/>
	\$3,247 72

## EXPENDITURE.

Printing.....	579 78
Stamps, Paper, &c.....	95 90
Travelling expenses of directors.....	127 27
Grants and expenses of the convention.....	109 67
Salary of the secretary-treasurer.....	200 00
Travelling expense, teaching (see syndicates).....	0 00
Prizes for competition.....	70 00
Purchase of books and subscriptions.....	12 25
Extraordinary expenses.....	22 76
Syndicates.....	1,893 61
	<hr/>
	\$3,111 24
Balance on hand.....	136 48
	<hr/>
	\$3,247 72

## REPORT OF THE AUDITORS.

(See page 26 above.)

- (1) \$300.00 still due from the Department of Agriculture.  
 (2) \$300.00 “ “ “

## List of Me

Arthabaskaville .....
Chester .....
St. Norbert.....
Tingwick .....
Bulstrode .....
Stanford. ....
Trottier P. O.....
St. Dominique .....
“ .....
“ .....
Upton .....
Ste. Hélène.....
“ .....
St. Hugues.....
“ .....
“ .....
St. Pie.....
“ .....
“ .....
St. Simon .....
Acton Vale .....

# List of Members of the Association

FOR THE YEAR 1891.

## COUNTIES.

### ARGENTEUIL.

### ARTHABASKA.

Arthabaskaville .....	Michel, Jos.
Chester .....	Camiré, Léon
St. Norbert .....	St Pierre, Germain
Tingwick .....	Bédard, Octave.
Bulstrode .....	Trudel, Joseph
Stanford .....	Fréchette, Gédéon
Trottier P. O.....	Dumas, P.

### BAGOT.

St. Dominique .....	Chagnon, Emile
" .....	Fradette, Norbert
" .....	Lécuyer, H.
" .....	Tétreau, Maxime
Upton .....	Chicoine, Delphis
St. Hélène.....	Dufault, E.
" .....	Houle, M. E.
" .....	Sylvestre, Euclide
St. Hugues.....	Brodeur, L. Th.
" .....	Lafontaine, E.
" .....	Simoneau, Willis C.
" .....	Toupin, Alexandre
St. Pie.....	Lussier, Louis
" .....	Pomerat, Charles
" .....	Roy, P. E.
St. Simon .....	Valcourt, N. S.
Acton Vale .....	McDonald, Milton

URE

1891.

\$1,200 00  
500 00  
Memorandum  
0 00  
351 00  
6 90  
3 00  
0 00  
11 49  
175 39  
1,000 00  
-----  
\$3,247 72

579 78  
95 90  
127 27  
109 67  
200 00  
0 00  
70 00  
12 25  
22 76  
1,893 61  
-----  
\$3,111 24  
-----  
136 48  
-----  
\$3,247 72

## BEAUCE.

Sts. Anges.....	Lagueux, Georges
Forsyth.....	Lachance, Jos
St. Francis.....	Bolduc, Chas
St. Georges.....	Bolduc, Ludger
".....	Montminy, Revd M
" East.....	Garneau Fulbert
St. Joseph.....	Lambert, Jos
".....	Roy, Noel
".....	Roy, Vital
Tring.....	Mercier, Bernard
".....	Paradis, Alexandre
".....	Veilleux, Philéas
Sacré-Cœur de Jésus.....	Champagne, Vital

## BEAUHARNOIS.

St. Louis de Gonzague.....	Lepage, Hormisdas
----------------------------	-------------------

## BELLECHASSE.

St. Raphael East.....	Gonthier, P
-----------------------	-------------

## BERTHIER.

Berthier.....	Tranchemontagne, L.
St. Barthélemy.....	Brunette, Olivier
St. Cuthbert.....	Courchesne, Ulric
".....	Grégoire Joachim
".....	Robert Antoine
St. Gabriel de Brandon.....	Beaudry Jos
".....	Dubeault, Georges
St. Norbert.....	Coulombe, Jos

## BONAVENTURE

Port Daniel.....	Gagnon Revd M. Aug
Little Cascapedia.....	Pelletier, Marius

## BROME.

Knowlton.....	Fisher, S. A.
---------------	---------------

.....	Champlain.....
.....	Batican.....
.....	".....
.....	".....
.....	St. Maurice.....
.....	St. Norbert.....
.....	St. Prosper.....
.....	".....
.....	".....
.....	Vincennes St. Luc

La Malbaie.....

Howick (North Ge  
Ste. Martine.....

".....

CHI

Chicoutimi.....

".....

".....

N. D. de Laterrière

".....

".....

".....

".....

Rivière aux Sables

".....

".....

St. Alphonse.....

".....

Ste. Anne.....

## CHAMBLY.

## CHAMPLAIN.

Champlain.....	Clément, N. E.
Batiscan.....	Jacob, Ernest
".....	Massicotte, Geo.
".....	" Roch
St. Maurice.....	Blondin, F. X.
St. Norbert.....	Cossette, J. F.
St. Prosper.....	Trudel, Alf.
".....	" F. X. O.
".....	" J. E.
Vincennes St. Luc.....	Beaudoin, O.

## CHARLEVOIX.

La Malbaie.....	Bradette, Jules
-----------------	-----------------

## CHATEAUGUAY.

Howick (North Georgetown).....	Marleau, Etienne
Ste. Martine.....	McGowan, Ed.
".....	Pruneau, Louis J.

## CHICOUTIMI AND SAGUENAY.

Chicoutimi.....	Maltais, David
".....	" François
".....	Tremblay, Charles
N. D. de Laterrière.....	Couture, Adélar
".....	" Octave
".....	" Paul
".....	Tremblay, Albert
".....	" Thomas
Rivière aux Sables.....	Angers, Pascal
".....	Brassard, Jean
".....	Girard, Jean
St. Alphonse.....	Paradis, Firmin
".....	Tremblay, Wilfrid
Ste. Anne.....	Côté, Henri

## COMPTON.

East Clifton .....	Lussier, E. S.
Clifton .....	Boulay, G.
Auckland.....	Gendron, Jos.
Lingwick-Gould, P. O.....	Painchaud, Jos. L.

## DEUX-MONTAGNES.

St. Benoit .....	Binet, J. Evangeliste
St. Eustache .....	Girouard, Joseph
St. Joseph des Deux-M.....	McCall, Hugh

## DORCHESTER.

Ste. Claire.....	Richard, Geo.
St. Isidore.....	Pomerleau, Philibert

## DRUMMOND.

Drummondville .....	Richard, J. U.
Durham, South .....	Asselin, Charles
" .....	Mongeau, Ulféry
" .....	Préfontaine, Fulgence
Kingsey, French Village.....	Cartier, T. C.
" .....	Gouin, Alexis
" .....	Lefebvre, J. P.
L'Avenir.....	Charpentier, Ephrem
" .....	Duguay, Paul
Wendover .....	Côté, Gaspard
" .....	Raymond, Napoléon
St. Eugène .....	Lapierre, Honoré
Grantham .....	Gauthier, Michel
Wickham West.....	Lafrance, Jos.

## GASPE.

## HOCHELAGA.

Mile End.....	Charest, Revd F. M. A.
---------------	------------------------

.....  
St. Alexandre.....  
St. Sabine.....

St. Geneviève.....

St. Elizabeth .....

St. Jean de Marthe

"

"

Rivière Ouelle.....

St. Anne Lapocatiè

"

"

St. Denis en bas....

"

St. Félicien.....

St. Gédéon.....

St. Prime .....

St. Louis.....

Normandin .....

St. Isidore de Lapra



## HUNTINGDON.

## IBERVILLE.

St. Alexandre..... Brault, fils, Narcisse  
 St. Sabine..... Boudreau, Pierre

## JACQUES CARTIER.

St. Geneviève..... Meloche, J. B.

## JOLIETTE.

St. Elizabeth..... Boisvert, Alexis  
 St. Jean de Martha..... Brault, Joseph  
 "..... Clermont, Honoré  
 "..... Gravel, L. Jos.

## KAMOURASKA.

Rivière Ouelle..... Gagnon, L. Phil,  
 St. Anne Lapocatière..... Gendron, Frs.  
 "..... Lévesque, Emile  
 "..... Morais, Edward  
 St. Denis en bas..... Chapais, J. C.  
 "..... Gagnon, Frs.

## LAKE ST. JOHN.

St. Félicien..... Jalbert, Placide  
 St. Gédéon..... Girard, Jos.  
 St. Prime..... Fortin, D. et Cie  
 St. Louis..... Lefrancois, Octave  
 Normandin..... Trottier, J. E.

## LAPRAIRIE.

St. Isidore de Laprairie..... Trudel, Jos. son of Amable

## L'ASSOMPTION.

L'Assomption .....	Longpré, Alfred
" .....	Lord, Aimé
" .....	Marsan, I. J. A.
St. Lin Laurentides.....	Archambault J.
" .....	Desmarais, E.
St. Paul l'Hermité.....	Chagnon, Samuel

## LAVAL.

St. Martin .....	Allard, J. L.
St. Vincent de Paul .....	Paré, C. E.

## LEVIS.

St. Henri de Levis.....	Fortier, Adolphe
" .....	" Philippe

## L'ISLET.

L'Islet .....	Boucher et Leclerc
" .....	Caron, Nazaire
" .....	Thibault, J. A.
St. Jean Port Joli.....	Deschênes, Az.
St. Roch.....	Pelletier, Alexis
" Village des Aulnaies.....	" Auguste

## LOTBINIERE.

Lotbiniere .....	Bernier, Gédéon
" .....	Bernier, Henri
" .....	Pépin, Léger
St. Edouard.....	Coulombe, Ferdinand
" .....	Lord, Hippolyte
St. Emélie.....	Gagné, Théophile
St. Flavien.....	Bédard, Lazare
" .....	Bernard, D. U.
" .....	Coté, Saul
St. Giles.....	Garon, Rev. M. S.
St. Jean des Chaillons .....	Allard, Jos. Napoléon

St. Didace.....	.....
St. Justin.....	.....
" .....	.....
" .....	.....
" .....	.....
" .....	.....
St. Ursule.....	.....
" .....	.....

Matane.....

Plessisville .....	.....
" .....	.....
Richardville (Ir	.....
St. Ferdinand d	.....
" .....	.....
" .....	.....

St. Julie.....	.....
St. Sophie.....	.....
" .....	.....
Somerset.....	.....
" .....	.....

Stanbridge Stati

St. Jacques.....

Montmagny .....

## MASKINONGÉ.

St. Didace.....	Lanois, Philippe
St. Justin.....	Baril, Pierre
“ .....	Coulombe, Doctor J. C. (M. D.)
“ .....	Gérin, Revd M. D.
“ .....	Philibert, Désiré
“ .....	“ Edouard
“ .....	“ Salomon
St. Ursule.....	Boland, George
“ .....	Lessard, Delphis

## MATANE.

Matane.....	Harrison & Truchon
-------------	--------------------

## MEGANTIC.

Plessisville.....	Drouin, P. O.
“ .....	Jutras, Alfred
Richardville (Ireland).....	Caron, J. Ad.
St. Ferdinand d'Halifax.....	Bilodeau, William
“ .....	Gilbert, Louis
“ .....	“ Oscar
“ .....	Thibault, Louis
Ste. Julie.....	Mercier, F. T.
Ste. Sophie.....	Cloutier, Sauveur
“ .....	Pelletier, Barthélemy
Somerset.....	Clairefils, Dr. E. C P.
“ .....	Chapdelaine, Elie

## MISSISQUOI.

Stanbridge Station.....	Campbell, Julien
“ .....	Mettig, Narcisse

## MONTCALM.

St. Jacques.....	Widow Salomon
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## MONTMAGNY.

Montmagny.....	Bernatchez, Naz., M. P. P.
“ .....	“ Numa

Montmagny .....	Hébert Hubert
Cap St. Ignace .....	Jalbert, Jos. E.
Isle aux Grues .....	Vézina, Jos.
St. François .....	Daignault, F. X.
St. Pierre .....	Proulx Théo.
St. Paul du Buton ....	Tanguay, Revd G, O.

## MONTMORENCY.

St. Joachim .....	Brown, Hugh
" .....	Pépin, Jos. Noé

## MONTREAL.

Montreal .....	Beaubien, Hon. Ls. St. James st.
" .....	" Jos. " "
" .....	Collard, A. Beaver Hall Sq. 77
" .....	Gérin, M. Auguste, Berry str., 12
" .....	" M. Léon " " "
" .....	Herreboudt, J.
" .....	Langlois, Ch. et Cie., St Paul st 241
" .....	MacPherson, D. A., William street
" .....	Vaillancourt, J.A St. Anne's Market

## NAPIERVILLE.

St. Rémy .....	Latour, Chs Huguet
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## NICOLET

Nicolet .....	Desfossés, Napoléon
" .....	Lecomte, E.
Bécancour .....	Leticq, Alb., (Bangor, Me. U. S.)
Ste. Brigitte d s Saults..	Lemire, Jos.
St Célestin .....	Camirand, Drummond
" .....	Duguay, Philemon
g e de Nic t.....	Parent, Jos.
St. Grégoire .....	Arel, Avila
" .....	Désautels, Arthur E.
" .....	Dufresne, Hubert
Aston .....	Bergeron, Paul
Ste. Monique .....	Boittaire, Evariste

Ste. Monique ..  
 " ..  
 " ..  
 " ..  
 Ste. Perpétue..

Cap Santé. ....

Deschambault ..

Grondines.....

St. Alban.....

St. Augustin....

St. Bazile.....

St. Casimir .....

" .....

St. Jeanne de N

St. Raymond....

" .....

Quebec-Ville....

" .....

" .....

Quebec St Sauv

La Canardière...

Beauport, .....

Ste. Monique.....	Milot, Chas.
".....	Milot Victor
".....	St. Germain, Evariste
" (Gd St. Esprit).....	Pinard, Joseph
Ste. Perpétue.....	Girard, Luc

.....

OTTAWA.

.....

PONTIAC.

.....

PORTNEUF.

Cap Santé.....	Bernard. L. P.
".....	Leclère, Uld.
".....	Massé, Pierre
Deschambault.....	Bédard, Aubert
".....	Massé, Noel
".....	Naud, Albert
".....	Paré, N. T.
Grondines.....	Archambault, Louis
St. Alban.....	Perron, Hubert
St. Augustin.....	Rochette, Phid.
St. Bazile.....	Dérôme, J.
St. Casimir.....	Galarneau, Revd M.
".....	Perron, Jos.
St. Jeanne de Neuville.....	Bussière, Ambroise
St. Raymond.....	Doré, Louis
".....	Proulx, F. X.

.....

QUEBEC.

Quebec-Ville.....	Labelle, Mgr.
".....	Gagnon, Revd M. P. C.
".....	Thibaudeau, J. B.
Quebec St Sauveur.....	Hôpital du Sacré-Cœur
La Canardière.....	Lortie, Honoré
Beauport,.....	" Pierre

St. James st.  
 " "  
 [all Sq. 77  
 Berry str., 12  
 " " "  
 " " "  
 St Paul st 241  
 William street  
 Anne's Market

or, Me. U. S.)

nd

## RICHELIEU.

Sorel.....	Brousseau, Hertel
".....	Cournoyer, J. B.
".....	Finlay, David
".....	Guèvremont, Séraphin
".....	Hébert, Michel
".....	Vanasse, A. P.
St. Louis de Bonsecours.....	St Martin, Antoine
St. Ours.....	Durocher, Edouard

## RICHMOND.

Windsor.....	Bourgault, J. O.
".....	Richer, George
Flodden.....	Stalker, Duncan
Melbourne Ridge.....	Fleurant, Magloire

## RIMOUSKI.

Bic.....	Brun, Auguste
St. Donat.....	Morissette, Honoré
Ste. Luce Station.....	Pelletier, J. A.
St. Simon.....	Nicole, A. A.

## ROUVILLE.

Abbotsford.....	Carrignan, Thos.
" (Pauline).....	Rochelean, Hormisdas
St. Césaire.....	Bourbeau, Elie
".....	St. Pierre, Isidore
St. Jean Baptiste.....	Allard, Jos. Napoléon
".....	Dusseault, Philibert
".....	Tétreau, J. D.
Ste. Marie de M., (Marieville).....	Gingras, Hubert
L'Ange Gardien (Angeline).....	Lévesque, Napoléon

## ST. HYACINTHE.

St. Hyacinthe.....	Allard, Octave
".....	Archambault, J. Misaël
".....	Archambault, Arthur
".....	Chartier, Revd M. J. B.

St. Hyacinthe.

"

"

"

"

St. Charles....

St. Damase....

"

St. Denis.....

"

Ste. Madeleine....

"

La Présentation

"

"

Shawenegan ...

St. Sévère.....

South Stukely ..

Shefford Mount

St. Valérien .....

"

"

"

"

"

"

"

Milton .....

" (Egypte)

Roxton, East....

" Falls ...

St. Hyacinthe.....	Choquette, Revd M. L. P.
“ .....	Côté, Louis
“ .....	Taché, J. de L.
“ .....	Tanguay, Michel
“ (Gd. range).....	Bienvenu, Napoléon
St. Charles.....	Denis, Louis
St. Damase.....	Jodoin, Jacques
“ .....	Marchesseault, { S. T. from. de Corbin.
	Z. T. “ “ “ Pont.
St. Denis.....	Gareau, Victor
“ .....	Huard, Fois.
Ste. Madeleine..	Chabot, Napoléon
“ .....	L'étourneau, Camille
La Présentation.....	Beaudry, Revd M. C. A.
“ .....	Daigle, Cyrille
“ .....	Piché, M. A.

## ST. JEAN.

## ST. MAURICE.

Shawenegan .....	Lamy, Josaphas
St. Sévère.....	“ Euchariste

## SHEFFORD.

South Stukely .....	Benoit, J. B.
Shefford Mountain .....	Boulé, Gédéon
St. Valérien .....	Adam, Delvica
“ .....	Cadieux, J. B. E.
“ .....	Côté, Revd M. F. P.
“ .....	Desmarais, Prosper
“ .....	Guertier, Jos.
“ .....	Grandpré, Louis
“ .....	Marsan, Arthur
“ .....	Vadnais, Cléophas
Milton .....	Langevin, Apollinaire
“ (Egypte de).....	Côté, Victor
Roxton, East.....	Beauregard, J. B.
“ Falls .....	Aubertin, J. B.

Roxton Falls.....Brazeau, Louis  
 " ".....Poirier H.  
 " Pond.....Benoit, Damien  
 Racine Ely.....Fleurant, Louis  
 South Ely.....Choinière, Modeste  
 Lawrenceville.....Vadnais, Joseph  
 Granby.....Allard, Pierre  
 Mawcook .....Morissette, Nérée

SHERBROOKE.

Sherbrooke .....Dellicour, Alfred  
 " .....Noel, Elisée

SOULANGES.

Pont Château.....Bourbonnais, J. A.  
 St. Polycarpe.....André, Jos.  
 " .....Blondin, Théophilu  
 " .....Bourbonnais, Ant.  
 " .....Nap.  
 " .....Leclair, J. Hector

STANSTEAD.

Ste. Catherine.....O'Hareland, Jos.

TEMISCOUATA.

Trois-Pistoles .....Massé, J. Octave  
 L'Isle Verte.....Préfontaine, Chs.

TERREBONNE.

Ste. Thérèse.....Deejardins, Antoine  
 " .....Dion, Frs  
 " .....Labonté, Revd M.<sup>r</sup>J. J.  
 " .....Leclère, J. Damien

THREE RIVERS.

VAUDREUIL.

Vaudreuil .....Besner, Athanase  
 " .....Denis, Paul

Belœil.....  
 ".....  
 Ste. Julie.....  
 ".....  
 ".....  
 St. Marc.....  
 ".....  
 ".....

North Ham.....  
 Wotton.....  
 ".....  
 ".....  
 ".....  
 St. Fortunat.....  
 Wolfstown.....

La Baie du Febv.....  
 ".....  
 ".....  
 ".....

St. David.....  
 ".....  
 St. Elphège.....  
 ".....  
 ".....  
 St. François du I.....  
 Yamaska.....  
 Pierreville.....  
 ".....  
 St. Zéphirin.....

Langueux, par St  
 15



## VERCHERES.

Belœil.....	Blain, Félix
".....	Choquette, M. Cyrille
St. Julie.....	Blain, Louis
".....	Daigneault, Revd M.
".....	Rouleau, Emile
St. Marc.....	Chicoine, Alexis
".....	" Arthur
".....	Leroux, Dr

## WOLFE.

North Ham.....	Martel, Eusèbe
Wotton.....	Bonhomme, Delle P
".....	Geoffroy, Jos.
".....	Lord, Alphonse
".....	Plamondon, J. E.
St. Fortunat.....	Girard, Jos.
Wolfstown.....	Simoneau, Alexandre

## YAMASKA.

La Baie du Febvre.....	Belle Isle, Achille
".....	Lafond, Georges
".....	" Onésime
".....	Lemire, J. Louis
".....	Vigneau, J. B.
St. David.....	Cyr. Chs.
".....	Fontaine, Herménégilde
St. Elphège.....	Lepine, Théogène
".....	Paquette, Siméon
".....	Parent, William
St. François du Lec.....	Lefebvre, Herman
Yamaska.....	Fagnan, Hormisdas (2)
Pierreville.....	Bibeau, Roméo
".....	Parent, Elisée
St. Zéphirin.....	Duguay, J. N.

## FRANCE. (Côtes du Nord)

Langueux, par St. Brienc.....	Aignel, (M. l'abbé J. B.)
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## TOTAL MEMBERS OF THE ASSOCIATION BY DISTRICTS.

Districts.	Counties.	Total by counties	Total by districts
Arthabaska.....	Arthabaska .....	7	
" .....	Drummond .....	14	
" .....	Megantic.....	12	33
Beauce .....	Beauce.....	13	
" .....	Dorchester .....	3	16
Beauharnois .....	Beauharnois .....	1	
" .....	Chateauguay .....	3	
" .....	Huntingdon .....	0	4
Bedford .....	Brome .....	1	
" .....	Missisquoi.....	2	
" .....	Shefford .....	22	25
Charlevoix .....	Charlevoix .....	1	1
Chicoutimi et Saguenay..	Chicoutimi & Saguenay.....	14	
" .....	Lake St. John.. .....	5	19
Gaspé .....	Gaspé.....	0	
" .....	Bonaventure.....	2	2
Iberville .....	Iberville .....	2	
" .....	Napierville.....	1	
" .....	Saint-Jean.....	0	3
Joliette .....	Joliette .....	4	
" .....	L'Assomption .....	6	
" .....	Montcalm .....	2	12
Kamouraska.....	Kamouraska .....	6	
" .....	Témiscouata .....	2	8
Montmagny.....	Bellechasse .....	1	
" .....	L'Islet .....	5	
" .....	Montmagny .....	9	14
Montreal .....	Montreal .....	8	
" .....	Hochelaga .....	1	
" .....	Jacques-Cartier .....	1	
" .....	Laval .....	2	
" .....	Vaudreuil.....	2	
" .....	Soulanges .....	5	
" .....	Laprairie .....	1	30
" .....	Chambly.....	0	
" .....	Verchères.....	8	
	To carry over.....		167

## TOTAL MEMBE

Districts.
Ottawa.....
" .....
Quebec.....
" .....
" .....
" .....
Richelieu .....
" .....
" .....
Rimouski.....
" .....
St. François.....
" .....
" .....
" .....
St. Hyacinthe.....
" .....
" .....
Terrebonne.....
" .....
" .....
Three Rivers.....
" .....
" .....
" .....
France.....

DISTRICTS.

TOTAL MEMBERS OF THE ASSOCIATION BY DISTRICTS — *Con.*

Total by counties	Total by districts	Districts.	Counties.	Total by county.	Total by district.
7					
14					
12	33		Brought forward.....		167
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1		".....	Pontiac.....	0	0
3		Quebec.....	Quebec.....	6	
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1		".....	Montmorency.....	2	
2		".....	Levis.....	2	
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14		".....	Richelieu.....	8	
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2		St François.....	Compton.....	4	
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